United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

699

BRIEF FOR APPELLANT

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

NO. 20,252

WILLIAM R. GASKINS,

Appellant

v.

UNITED STATES OF AMERICA,

Appellee

Appeal from a judgment of the
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

United States Court of Appeals
for the District of Columbia Circuit

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STATEMENT OF QUESTIONS PRESENTED

I

Whether the trial Court erred in denying a motion for a judgment of acquittal where the uncontroverted evidence established long-standing narcotic addiction causally related to the acts charged and where the preponderance of the evidence established mental illness in the form of a severe schizoid personality.

II

Whether the trial Judge erred in failing to give Defendant's Proposed Instruction No. 2 on the relation of mental abnormality to narcotic addiction where addiction and causation were conceded and where the record contained substantial evidence of withdrawal symptoms at the time of commission of the acts charged.

III

Whether the verdict was contrary to the weight of the evidence and, in fact, not supported by any substantial evidence refuting the substantial evidence of insanity by reason of defendant's severe schizoid personality coupled with long-standing narcotic addiction, and the presence of withdrawal symptoms.

IV

What degree of proof of mental illness combined with narcotic addiction is sufficient in the District of Columbia to excuse otherwise criminal acts on grounds on insanity?

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Brief for Appellant

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JURISDICTIONAL STATEMENT

This appeal is from a conviction in the United States District Court for the District of Columbia on five counts of a seven-count indictment charging violation of Title 22 of the District of Columbia Code §§ 2901 (robbery), 502 (assault with dangerous weapon), 505(a) (assault on police officer), and 3204 (carrying dangerous weapon). A jury, on April 5, 1966, found appellant guilty on Counts Three, Four, Five, Six, and Seven. Counts One and Two were dismissed prior to submission of the case to the jury.

On May 27, 1966, appellant was sentenced to imprisonment for three to nine years on Counts Three, Four and Five, for one to three years on Count Six, and for one year on Count Seven; said sentences by counts to run concurrently. The Court recommended commitment to Lexington, Kentucky. On June 6, 1966, Judge Corcoran permitted appellant to proceed on appeal without prepayment of costs and with appointed counsel.

The jurisdiction of this Court on appeal is founded on Title 28 U.S.C. §1291, 62 Stat. 929, as amended, (1948).

STATEMENT OF THE CASE

The case proceeded to trial below on stipulated facts which were read to the jury (Tr. 7-9*). These stipulated facts established the commission by appellant, on February 20, 1965, of acts as charged in Counts Three, Four, Five, Six, and Seven of the indictment, and counsel appointed by the trial Court elected to try the case solely on the basis of the specific defense of insanity. Appellant, who was apprehended at the scene of the offenses charged, was taken into custody and, by Court order, committed to Saint Elizabeths Hospital for examinations as to his mental competency on March 26, 1965. He remained there under observation until, by Court order of July 6, 1965, he was found mentally competent to stand trial and properly able to assist in his own defense.

In reporting to the Court on the findings of St. Elizabeths Hospital as a result of the examinations which he underwent there, the Superintendent, Dr. Dale C. Cameron, stated in a letter dated June 17, 1965, that, on the date of the offenses charged, "Mr. Gaskins was actively addicted to narcotics, and *** the criminal acts with which he is charged, if committed by him, were causally related to his narcotic addiction."

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* All references herein to transcript pages relate to Vols. I, II, III and V except where Vol. IV references are specifically given. This was made necessary because Vol. IV was transcribed 5 months before the rest of the transcript and its pages independently numbered.

After appellant was returned to the D.C. Jail to await trial, he again, at the request of the Court, underwent a psychiatric examination on September 16, 1965. Dr. Irwin J. Papish of the D.C. Dept. of Public Health, conducted this examination. By letter of October 22, 1965, Dr. Papish reported him competent to stand trial and to properly assist in his defense. Dr. Papish expressed the opinion that the acts charged "if committed by William Gaskins, were perpetrated in order to obtain money to finance his addiction to narcotics". While he expressed his opinion that narcotic addiction is not a mental illness, he added, however, that appellant "has long-standing personality problems which may have predisposed and contributed to his adoption of the habit of narcotic addiction."

Both the report of Dr. Cameron and that of Dr. Papish are in the record on appeal.

The entire evidence at the trial below, which lasted 4-1/2 days, consisted of certain hospital records introduced as exhibits and the testimony of five experts relative to appellant's mental condition and narcotic addiction, and four laymen (his mother, the woman who lived with him as his wife, and two police officers who effected his arrest), who gave their own observations as to his apparent mental state.

All expert witnesses who testified (three for the defense and two for the Government) agreed (1) that Gaskins was a narcotic addict, (2) that the commission of the acts charged was causally related to his addiction, and (3) that he had a schizoid personality. While Government experts agreed on the finding of a schizoid personality (Tr. 459, Vol. IV 22), they did not concede that this amounted to mental illness.

At the conclusion of the testimony of these witnesses, counsel appointed by Court to represent defendant moved for a judgment of acquittal. This motion was denied. (Tr. Vol. IV 101) Defense counsel submitted three proposed instructions for the trial judge's charge. The judge gave the essence of two of these, but denied the motion that Defendant's Proposed Instruction No. 2 be given. (Tr. Vol. IV 126) This Proposed Instruction No. 2, which is a part of the record before this Court, related to the causal relation of narcotic addiction, and the withdrawal symptoms thereof to the crimes charged. The trial judge stated, in a bench conference, "For the reasons I stated before, I will deny your motion." (Tr. Vol. IV, p. 126) Regrettably, the "reasons" do not appear on the record, but were presumably given orally in a conference in chambers.

On April 5, 1966, the jury returned a verdict of guilty on all five counts. Appellant was sentenced on May 27, 1966, to imprisonment for three to nine years on Counts Three, Four, and Five, to one to three years on Count Six, and to one year on Count Seven; the sentences to run concurrently. The Court recommended commitment to Lexington, Kentucky, which was in accordance with the recommendation of Dr. Cameron and of trial counsel appointed for defendant. On June 6,1966, Judge Corcoran granted the request that appellant be permitted to proceed without prepayment of costs in this appeal, and with appointed counsel. This Court appointed this counsel to represent appellant by order of July 18, 1966. The reporter's transcript filed as a supplemental record on appeal was docketed on February 28, 1967.

STATUTES, TREATIES, REGULATIONS, OR RULES INVOLVED

The issues raised by this appeal do not require specific reference to any statute, treaty, regulation, or rule.

STATEMENT OF POINTS

1. The motion for a judgment of acquittal was erroneously denied where there was concededly long-standing narcotic addiction plus strong evidence of withdrawal symptoms and where there was substantial evidence of mental illness, i.e., severe schizoid personality.

2. The trial judge erred in refusing to charge the jury, as requested, on the question of narcotic addiction as a mental abnormality which could substantially affect defendant's mental and emotional processes and substantially impair his behavior controls, since the refusal effectively precluded the jury from considering admitted addiction as symptomatic of underlying mental illness.

3. The instructions to the jury unfairly permitted the jury to speculate on defendant's use of narcotic drugs when the evidence of such use and his addiction thereto for a long time was uncontroverted and conceded by Government and defense witnesses alike.

4. The trial judge erred in instructing the jury in a manner which permitted them to decide the issue of productivity where this had already been established by all witnesses and was supported by the letters in the record from Dr. Cameron and Dr. Papish.

5. The substantiality of the record evidence of appellant's mental abnormality was such that reasonable men and women could not differ on this point had they been properly charged, and the judge's failure to relate drug addiction to insanity, both in the original charge and in response to a specific question from the jury, were highly prejudicial to appellant under the circumstances.

SUMMARY OF ARGUMENT

In a case such as this involving a defendant with a repeated record of criminal activity from the time he was ten years old to the time of the instant trial and where, as here the acts charged in the indictment were admitted by stipulation and the case was tried solely on the defense of insanity, it becomes, of course, critically important to assure that the trial judge, in his conduct of the trial be extremely careful in safeguarding defendant's constitutionally guaranteed right to a fair trial. Since it was conceded by Government and defense witnesses alike, and clearly shown in other record evidence, that defendant was a narcotic addict of long-standing, and since it was conceded that such addiction was causally related to the acts committed, when defendant adduced not just "some evidence" but substantial evidence of mental illness, the weight of the evidence of insanity was such that, not only was the presumption of sanity rebutted, but the evidence was such that no reasonable man or woman could conclude otherwise.

Under these circumstances, it was prejudicial error to deny defendant's motion for a judgment of acquittal and to permit the case to go to the jury irrespective of the care given in instructing the jury on the insanity issue.

Stated conversely, the evidence of sanity was so insubstantial as to require a judgment of acquittal.

However, assuming, arguendo, that the posture of the evidence was such as to justify submission of the case to the jury, the trial judge committed prejudicial error in declining to instruct the jury as requested in Defendant's Proposed Instruction No. 2. The error was prejudicial in that it permitted the jury to speculate on the issue of productivity or causal relationship where this element was established and uncontroverted by any evidence of record. It was also prejudicial in that the trial judge failed to give an instruction which would permit the jury to take into account the combined effect of narcotic addiction and mental illness.

ARGUMENT

Summarized Record Evidence

Because the trial below proceeded on stipulated facts which conceded commission of the acts charged in the indictment, and because the entire trial below was based upon the defense of insanity, it is deemed necessary to present here a summary of the record evidence pertinent to that defense.

The record evidence presents a picture of a young man 27 years old who had been in trouble with authorities for violations of the law since he was 10 years old, and who had been in and out of institutions most of that time for various criminal acts, mostly offenses against property. He, when arrested on February 20, 1965, was conceded by all witnesses and by all record evidence to be a narcotic addict, having originally started taking narcotic drugs in June of 1961 to ease the pain of a peptic ulcer (Tr. 26, 62, 64). Gaskins' record presented a long history of failure to adjust to the society in which he lived, when not institutionalized. (Tr. 20, 24, 51-3, 60, 68, 76-7, 119, 452.) On the other hand, when confined in various institutions, he always was a model prisoner.

On several occasions since becoming a narcotic addict he voluntarily was admitted to local hospitals for treatment, for his addiction, but never remained long enough for the treatment to have any effect. The evidence of his addiction was absolute, uncontroverted, and conceded by the prosecution and all witnesses. (Tr. 86, 98, 104, 107, 120-1, 336, 341, 357, 360, 363, 372-3, 379, 427, 429, 465-6, 479, Vol. IV 16, 24-5 and 95).

Considerable evidence was adduced to establish that Gaskins was not only under the compulsion of narcotic addiction but, at the time of the commission of the acts charged, also undergoing withdrawal symptoms, and that this condition resulted in his inability to judge right from wrong and substantially impaired his behavior control. (Def. Ex. No. 1; Tr. 29-31, 88, 114, 122-3, 137-8, 387-8, 466, Vol. IV 29, 39, and 88).

Gaskins was a man who was depressed and withdrawn (Tr. 20), exhibited a beaten attitude (Tr. 51), showing hopelessness and despair (Tr. 70-1). The woman with whom he lived testified he had "no real communication, no warmth ...nothing that I could hold on to or that any other normal couple would have to say or exchange with each other." He would "mostly just sit around...with his head down...hands folded...sort of eerie-like, you know, as though not in a trance but just thinking and thinking and thinking...he seemed to bind everything about him up in a knot within himself." (Tr. 428-9) She described one instance where he was taken to a hospital unconscious after having attempted suicide. (Tr. 431, 433-4, Def. Ex. 2). His mother testified that "he needed help...he would sit back and act as though he was in a deep study...he was there but it seemed as though his mind was somewhere else." (Tr. 438-9)

Gaskins, whenever the question arose, always described himself as a Negro although, in fact, both his parents were white. (Tr. 21-3, 82-4)

The first time the record reveals any attempt to assist defendant for any mental problem was during his confinement at Lorton Reformatory in 1960. While there he was seen and tested by the psychologist, Mr. Morgenstern, who saw him about 1 hour a week for a total of 34 interviews. (Tr. 399) Mr. Morgenstern testified that at that time Gaskins was "suffering from irrationality and some disordered and disorganized thinking." He indicated that some help should be afforded to him to help clarify his emotions and thinking. (Tr. 396) He testified that Gaskins, as a result of tests which he administered, was "high on paranoia tendencies and on schizophrenia". (Tr. 410)

Following defendant's arrest for the acts which resulted in the trial below, he was committed to St. Elizabeths Hospital for a 90-day period of observation and examination. This led to conclusions that he was mentally competent to stand trial. However, the Superintendent, Dr. Cameron, in a letter to the Clerk of the District Court dated June 17,1965, stated that on the date of the offenses charged, it was the opinion of those who examined and observed Gaskins that he "was actively addicted to narcotics, and that the criminal acts with which he is charged, if committed by him, were causally related to his narcotic addiction." Dr. Cameron's letter went on to state that it was "our opinion" (presumably that of his staff) that Gaskins' drug addiction did not constitute a mental illness and thus that there was no mental disease or defect at the time of commission of the acts charged. Nevertheless, he recommended that Gaskins be given "assistance with his problem" by the U.S. Public Health Service Hospital in Lexington, Kentucky. Presumably, the assistance referred to related to the narcotic addiction condition, since the letter did not concede the presence of mental illness.

During the trial, the expert who personally examined Gaskins at St. Elizabeths and who was most familiar with his case, Dr. William Schwartz, testified at length concerning his expert opinion, based on close observation of Gaskins for at least five 1-hour periods (Tr. 16). He prepared the clinical case study on Gaskins. (Tr. 17) His conclusion, as an expert psyciatrist, was a "diagnosis based on reasonable medical certainty". (Tr. 19) This diagnosis was that Gaskins was suffering from not only narcotic addiction but from a mental disease, namely, a "personality disorder, schizoid personality (Tr. 19) which Dr. Schwartz defined as a "mental disease" within the meaning of the definition given in Durham v. United States, 94 U.S. App. D.C. 228, 214 F.2d 862 (1954), and McDonald v. United States, 114 U.S. App. D.C. 120, 312 F.2d 847 (1962). He concluded that this was a "mental disease which impairs behavior controls" (Tr. 31) and he also stated that the severe schizoid personality disorder from which Gaskins was suffering alone might not have impaired his behavior controls, but that this condition, coupled with the narcotic addiction "certainly impaired his behavior controls". (Tr. 32) Accordingly, he concluded that Gaskins, on the date of the crimes charged was suffering from a mental disease and that "the crimes were the product of his mental disease." (Tr. 33)

Another key witness for the defense was Dr. John Francis Borriello, clinical psychologist at St. Elizabeths Hospital. Dr. Borriello administered a series of psychological tests to Gaskins. (Tr. 145) He was with Gaskins alone for about three uninterrupted hours. (Tr. 152) As a result of these tests, it was Dr. Borriello's opinion that there was no indication that Gaskins was suffering from brain damage (Tr. 143), but that his I.Q. was "in the borderline range of intelligence" (Tr. 146), "he was limited in his ability to effectively solve any of his problems of living" (Tr. 147), and he was an "extremely dependent individual" (Tr. 147, 317).

Dr. Borriello concluded from all of these tests and observations that Gaskins "was suffering from severe schizoid personality trait disturbance. (Tr. 148) Gaskins rated "very defective in the judgmental area" (Tr. 149) Dr. Borriello further stated that "to mobilize his inner reasons and introspective capacity, to get him to utilize these effectively for everyday problems, he would have to have therapeutic intervention; that is, he would have to have treatment... The type of treatment that I am talking about is psychotherapeutic, psychotherapy." (Tr. 323) It was Dr. Borriello's further opinion that in situations of stress, Gaskins "could behave in an aggressive, hostile, emotional fashion...He could have uncontrolled activity." (Tr. 324) In explaining Gaskins' "strong unmet infantile dependency needs", Dr. Borriello stated "this means that he has very strong dependency needs and that the demands he places upon others, upon his environment for satisfaction of these needs are excessive. They are very, very strong and very great and it is almost an impossibility to satisfy these needs." (Tr. 325)

Dr. Borriello formed the opinions expressed above before he became aware of Gaskins' background. (Tr. 333) He stated "the drug addiction and the severe schizoid personality are causally related." (Tr. 337) The underlying mental disorder, in Dr. Borriello's opinion, was, in Gaskins' case, the proximate cause of the narcotic addiction. (Tr. 355, 360) Because of Gaskins' severe personality disorder, "he doesn't have the control not to take" the drug; "he is compelled to take it." (Tr. 363) "His behavior controls are impaired 24 hours a day after he is addicted to the drugs, after he realizes that this satisfies something that was lacking before within him, which is related to the severe personality disorder." (Tr. 373) Dr. Borriello felt that Gaskins "knows right from wrong" but that "his severe personality disorder is such that even though he knows it is wrong to do this, he is compelled to do it because of his severe personality disorder." (Tr. 375-6)

A number of expert witnesses put on the stand by both defense and Government counsel testified concerning the severity of symptoms of withdrawal for the narcotic addict, and to the fact that Gaskins was undergoing these symptoms when he committed the acts charged. Dr. Schwartz assumed Gaskins was having withdrawal symptoms because he told him so. (Tr. 137-8) When Gaskins was apprehended and confined following the commission of the acts charged, he complained of withdrawal symptoms while in the D.C. Jail and was taken to D.C. General Hospital. (Tr. Vol. IV 88) The record of this hospitalization was admitted in evidence as Def. Ex. No. 1 and it contained the following doctor's admitting notes: "Psychiatry note, heroin addict brought in by police with abdominal cramps, occasional vomiting, no rhinorrhea or lacrimate or hypertension. Last fix 36 hours ago." (Tr. 387-8) Even the Government's expert witness, Dr. Mauris M. Platkin, admitted that an addict suffering withdrawal symptoms becomes so desperate that his "behavior control is essentially impaired." (Tr. Vol. IV 39) He admitted that Gaskins was "very likely" undergoing withdrawal symptoms at the time he committed the acts charged (Vol. IV 29).

The only other prosecution expert witness, Dr. Straty H. Economon, a psychiatrist at Saint Elizabeths Hospital who only saw Gaskins once in a staff conference lasting about three-quarters of an hour, agreed with the diagnosis that Gaskins has a schizoid personality, but he refused to call this mental illness. (Tr. 459-60) Dr. Economon also agreed that, on the date at issue, Gaskins was actively addicted to narcotics and that the acts committed by him "were causally related to his narcotic addiction." (Tr. 479)

In summary, all of the five expert witnesses who testified at this trial agreed that Gaskins was a narcotic addict, that his narcotic addiction was causally related to the commission of the acts charged, and that he had a schizoid personality. The two Government expert witnesses, Dr. Economon and Dr. Platkin, had only observed Gaskins at a staff conference which lasted no more than one hour. On the other hand, the three defense expert witnesses had extensive periods of observation of Gaskins in situations where they could talk to him alone and best observe in depth his personality, and were, therefore, in a much better position to express a conclusion concerning his mental state. For this reason, appellant believes it fair to characterize his evidence adduced on the sanity issue as substantial and entitled to great weight, whereas the Government's evidence on the insanity issue was plainly insubstantial.

The Denial Of A Motion For A Judgment Of Acquittal Was Prejudicial Error Where There Was No Evidence Refuting The Conceded Narcotic Addiction And The Causal Relationship To The Acts Charged And Where There Was No Substantial Evidence Refuting The Preponderance Of Evidence Of Mental Illness

From the foregoing summary of the evidence of record, it is readily apparent that all witnesses agreed that defendant was a narcotic addict of long-standing. It was also conceded by all that such addiction was causally related to the commission of the acts charged even though the two Government witnesses refused to concede that defendant was mentally ill.

With the record in this posture, therefore, the defense had not only rebutted the presumption of sanity by adducing "some evidence" of insanity, within the meaning of the rule established in Davis v. United States, 160 U.S. 469 (1895), but the defendant had produced very substantial evidence of insanity based on the testimony of both expert and lay witnesses who knew defendant best and who had observed him longest. With the case in this posture, it is respectfully submitted that the prosecution failed to sustain its burden of proving beyond a reasonable doubt that no mental disease or defect existed at the time of the commission of the acts charged. As the Supreme Court said in Davis v. United States, 160 U.S. 469 (1895):

> "If the whole evidence, including that supplied by the presumption of sanity, does not exclude beyond

> reasonable doubt the hypothesis of insanity, of which some proof is adduced, the accused is entitled to an acquittal of the specific offense charged." (160 U.S. at page 488)

We are aware that the foregoing rule has been considerably modified by more recent decisions, including decisions of this Court. However, it is submitted, even the more recent modifications do not preclude entry of a judgment of acquittal by reason of insanity on such a strong record as is present in this case.

Here the evidence proceeded far beyond a mere showing of narcotic addiction, in contrast to that presented to the Court in Heard v. United States, 121 U.S. App. D.C. 37, 348 F.2d 43 (1964), petition for a rehearing en banc denied (1965). Even conceding that mere narcotic addiction alone would not justify a finding of insanity so as to relieve defendant from criminal responsibility, and even conceding that all narcotic addicts are not mentally ill, the overwhelming weight of the evidence of this record is such that, with addiction and causation conceded, and the vast preponderance of the substantial record evidence establishing mental illness in the form of a severe schizoid personality, the trial judge should not have denied, as he did twice (Tr. 442, Vol. IV 101), the motion for a judgment of acquittal because, in doing so, and in submitting the case to the jury, he permitted the jury to ignore the concessions of addiction and causal relationship to the acts charged. Permitting jury speculation in this vital judgmental area on this record establishing mental illness by such a preponderance of the evidence was prejudicial error.

The foregoing state of the record also distinguishes this case from that presented to this Court in Castle v. United States, 120 U.S. App. D.C. 398, 347 F.2d 492 (1964), cert. denied, 381 U.S. 929, 953, rehearing denied, 382 U.S. 874 (1965). In the Castle case the only evidence adduced, and the only defense interposed related exclusively to the narcotic addiction. No evidence of mental illness was apparently present in the Castle case although it was there urged that the addiction itself was evidence of an underlying mental disease or defect. In the instant case, on the contrary, the great preponderance of evidence adduced, from both expert and lay witnesses, related specifically to mental disease or defect and, in appellant's view, there was no substantial evidence to refute such preponderance of evidence establishing such mental illness.

The attention of this Court is respectfully directed to an excellent law review article which discusses the leading cases and authorities, in this jurisdiction and elsewhere, on this subject. 1/

As this Court stated in Hightower v. United States, 117 U.S. App. D.C. 43, 325 F.2d 616 (1963), petition for a rehearing en banc denied (1964), cert. denied, 384 U.S. 994 (1966):

> "There must be a serious mental disease, and satisfactory evidence of causation, before a verdict of acquittal by reason of insanity must follow as a matter of law." (117 App. D.C. at page 46, 325 F.2d at page 619)

In another recent decision by this Court, Brown v. United States, 118 U.S. App. D.C. 76, 331 F.2d 822 (1964), the opinion quoted from a decision of the Supreme Court in Robinson v. California, 370 U.S. 660, 82 S. Ct. 1417 (1962), as follows (331 F.2d at p. 823):

> "'[N]arcotic addiction is an illness. *** "Of course it is generally conceded that a narcotic addict, particularly one addicted to the use of heroin, is in a state of mental and physical illness."'"

It is respectfully submitted that there is, in the present record, substantial evidence of a "serious mental disease", within the meaning of the Hightower and Brown cases, and "satisfactory", in fact conceded, evidence of causation. Therefore, it was error to deny the motion for a judgment of acquittal.

1/ The article, "Narcotic Addiction and Criminal Responsibility Under Durham", by Addison M. Bowman, was published in Vol. 53, No. 4, Summer, 1965, THE GEORGETOWN LAW JOURNAL, commencing at page 1017.

Assuming That The State Of The Evidence Required Submission Of The Case To The Jury, The Trial Judge Erred In Not Properly Instructing The Jury And Thus Permitting Them To Speculate On Critical Factual Issues To The Prejudice Of Defendant.

Appellant is aware of the body of recent decisions in this jurisdiction which support the concept that issues raised by insanity defenses are generally issues which, according to such decisions, should be decided by a jury. This Court's decision in the Heard case, cited above, does not, as we read it, hold otherwise. The narrow holding in the Heard case per curiam opinion was that a mere showing of narcotic addiction alone was insufficient evidence of insanity to raise the issue of criminal responsibility so as to require the giving of the "Durham-McDonald Instruction". As Judge Wright stated in his dissent in Heard, "In McDonald our purpose was, so far as the law would allow, to take the issue of mental illness out of the hands of judges and psychiatrists, and place it in the hands of the jury." (121 U.S. App. D.C. at p. 42; 348 F2d at p. 48)

In the instant case, Judge Corcoran did give the substance of the "Durham-McDonald Instruction" (Tr. Vol. IV 116-119) Judge Corcoran was clearly aware of the Heard decision and, in fact, made specific reference to it on the record but at bench conferences during the trial below. We are constrained to agree with Judge Corcoran when he said, for example, that the field of whether narcotic addiction is a mental illness is a difficult field (Tr. 41). Much later in the trial (Tr. 440-1) he again specifically named the Heard and Castle cases and referred to the fact that he was having his troubles in this "very difficult field of law."

A reading of the entire charge to the jury (Tr. Vol. IV 103-125) compels the reader to the conclusion that Judge Corcoran was making a careful effort to properly instruct the jury in accordance with the existing state of law on this subject in this jurisdiction. However, it is appellant's contention that, notwithstanding this care, the trial judge erred in permitting the jury to decide an issue which was conceded, namely, the essential element of causal relation, and also in failing to instruct in a manner which connected the combined effect of narcotic addiction and mental illness, as demonstrated by substantial record evidence in this case.

Judge Corcoran did include instructions on both mental illness and narcotic addiction but failed to properly advise the jury as to how they might find where, as here, there is both admitted narcotic addiction of long-standing, considerable evidence of the presence of withdrawal symptoms during the time at issue, and substantial evidence of mental illness. Trial counsel assigned by the Court below to represent defendant attempted to get some portion of this in the charge by Defendant's Proposed Instruction No. 2. At the conclusion of the charge he renewed a motion to have this Proposed Instruction given to the jury. The judge denied this motion (Tr. Vol. IV 128).

It is respectfully submitted that a proper instruction to the jury which would have specifically permitted them to consider the combined effect of mental illness and chronic narcotic addiction, coupled with instruction that the productivity issue was already established and conceded, would most probably have lead to a different verdict. The essential error in the charge as given was that jurors may well have understood that they must either decide that there was no criminal responsibility because of the narcotic addiction alone or because of the mental illness alone. They may not have understood that a consideration of both these factors could also lead them to a conclusion of not guilty by reason of insanity. Certainly, the failure to point up to the jury that they were entitled to consider this combination of circumstances in determining criminal responsibility precluded an important decisional process, to appellant's prejudice.

Moreover, there can be no doubt that trial judges, particularly in federal courts, may comment upon the evidence in instructing the jury so long as they make it clear, as Judge Corcoran did in this case (Tr. Vol. IV 103-4), that the facts are to be decided by them and not by the Court. The trial judge may even express his opinion on the questions of facts which he submits for their determination. As was recently stated in U.S. v. Garber, 263 F. Supp. 61 (D.C.E.D., Penna., Jan. 27, 1967), at page 63:

> "Well-settled law permits the trial judge to comment upon the evidence 'whenever he thinks it will assist the jury in arriving at a just conclusion.' *** 'the judge presiding at a trial, civil or criminal, in any court of the United States, is authorized, whenever he thinks it will assist the jury in arriving at a just conclusion, to express to them his opinion upon the questions of fact which he submits to their determination, ***'".

When Judge Corcoran stated to the jury that "narcotic addiction, without something more, does not justify a verdict of not guilty by reason of insanity since you may be an addict without it affecting his behavior at a given time or in a given way" (Tr. Vol. IV 119-120), he was echoing some of the holdings of this Court in recent decisions, including the Heard case and numerous authorities therein cited.

Judge Fahy, in his dissenting opinion in the Hightower case, stated:

> "I do not say that because a person is a drug addict he is for that reason suffering from a mental disease which relieves him of criminal responsibility for acts attributable to the addiction. Each case must be judged on the evidence in that case." (117 App. D.C. at page 48, 325 F.2d at page 621)

Defendant in this case, as stated, did not rely on the pure fact of drug addiction without more to relieve him from criminal responsibility. Nor did defendant rely only on the fact of addiction plus evidence that he was undergoing withdrawal symptoms at the time of commission of the acts charged. Substantial and highly persuasive expert opinion evidence of mental illness was adduced, as well as lay evidence from which a mental illness could most reasonably be found. In the words of Judge Fahy's dissenting opinion in Hightower:

> "*** the expert opinion evidence in this case was entitled to special weight, for it did not stand alone; it was related to a definite and long addiction of defendant to drugs, a condition which itself affects the mind and control of conduct. Moreover, there was not lacking a conclusive diagnostic opinion that the offenses were the product of the mental disease, ***"
> (117 U.S. App. D.C. at page 49, 325 F.2d at page 622)

The state of the record evidence in the instant case exactly fits the situation described by Judge Fahy's dissent quoted above except that, in this case, the issue of productivity or causation was conceded and uncontroverted.

Following the conclusion of Judge Corcoran's charge to the jury and after the jury had deliberated for some hours, the foreman sent a note to the judge which stated, "The jury would like a legal definition of insanity as given by the Court during the charge to the jury." (Tr. 541) It is apparent from this that the jury was still confused on the key issue in the case and needed further instructions. It was also apparent from this that the judge's response to this question would most likely control the entire outcome of the case insofar as the jury's verdict was concerned.

The judge responded to this note merely by repeating the bare substance of the Durham-McDonald Instruction. (Tr. 541-2) Appellant seriously urges that, where it was apparent that the jury still was in doubt as to the pivotal issue, they and the appellant were entitled to more than a simple restatement of the Durham-McDonald definition of insanity, because the giving of this definition which, to be sure, is directly responsive to the question asked by the jury, failed to relate this definition to the state of the evidence which clearly called for a consideration of the combined effect of insanity and chronic drug addiction on appellant's criminal responsibility for the acts charged. At this late stage in the jury deliberations, following the giving of the original charge, this failure to relate the definition of insanity to the whole body of evidence adduced on drug addiction and withdrawal symptoms was critically prejudicial and improperly permitted the jury to focus its attention only on the insanity factor apart from narcotic addiction. Had the judge answered the jury's question with not only the plain Durham-McDonald definition but, at that stage, also coupled this with an instruction which would permit them to consider the combination of mental illness and drug addiction, it is entirely possible, in fact probable, that the jury would have reached a different result.

Appellant seriously urges that the record evidence of mental illness, coupled with long-standing narcotic addiction and the presence of withdrawal symptoms, was so substantial, and the evidence to the contrary so insubstantial, that reasonable men and women, properly instructed, could not have failed to have a reasonable doubt as to appellant's sanity, and hence criminal responsibility for the acts charged. The prosecution had, therefore, failed to sustain its burden of proving sanity beyond a reasonable doubt. Permitting jury speculation on this posture of the evidence was, accordingly, reversible error.

CONCLUSION

For each and all of the foregoing reasons, appellant respectfully requests either (1) that his conviction be reversed and the case remanded with directions that the jury verdict be set aside and that the trial judge be directed to enter a judgment of acquittal by reason of insanity, or (2) that the conviction be reversed with directions to grant appellant a new trial.

Respectfully submitted,

Wayne K. Hill

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Brief for Appellant has been hand-delivered to the attorney for Appellee: The United States Attorney, at the United States Courthouse, Constitution Avenue and John Marshall Place, Washington, D. C., this 23 day of March, 1967.

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Wayne K. Hill

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BRIEF FOR APPELLEE

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,252

WILLIAM R. GASKINS, Appellant,

v.

UNITED STATES OF AMERICA, Appellee.

APPEAL FROM THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF COLUMBIA

United States Court of Appeals
for the District of Columbia Circuit

FILED MAY 1 1967

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DAVID G. BRESS,
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Cr. No. 280-65

QUESTION PRESENTED

Whether the defense of insanity was properly submitted to the jury by the trial court's instructions, which were carefully tailored to fit the facts of the case.

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UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,252

WILLIAM R. GASKINS, Appellant,

v.

UNITED STATES OF AMERICA, Appellee.

APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

BRIEF FOR APPELLEE

COUNTERSTATEMENT OF THE CASE

Appellant was convicted and sentenced to concurrent terms of imprisonment on five counts of a seven-count indictment charging him with robbery, two counts of assault with a dangerous weapon, assault on a police officer, and carrying a pistol without a license, 22 D.C. Code §§ 2901, 502, 505, 3204. The other two counts were subsequently dismissed.

The Facts of the Crime

At the outset of the trial, the Government's case was stipulated and the trial was all but wholly concerned with appellant's unsuccessful interposition of the defense of insanity. The stipulation, Tr. 7-9, established that appellant held up a Five-and-Ten at 4811 Georgia Avenue, N.W. at about 9:00 p.m., Saturday, February 20, 1965. Using a black automatic pistol, he forced the proprietor and a clerk to the back of the store and then to the basement, on the way picking up some plastic belts which which he had the clerk tie up her employer. He directed the girl back upstairs where, at gunpoint, he made her lock the door, answer the telephone when it rang, and assure the caller that all was well. He again directed her to the basement, and had just taken the proprietor's wallet (empty, it developed) from his pocket when the telephone again rang. As appellant and the girl returned upstairs, police arrived, and when she refused to tell them all was well he fled through the back door of the store. In the alley behind the store, appellant threatened to shoot one policeman, and ran up the alley until seized by several officers. The complainant's wallet and a fully loaded, cocked .25 caliber Beretta automatic pistol were found on appellant, who apologized profusely to both the police and the store personnel, although he refused to reveal the source of his pistol. Appellant's lack of a license for the pistol was also stipulated, Tr. 12, 541, and the Government rested.

Appellant's Case on Insanity

Appellant's case consisted of a psychiatrist and two psychologists, whose expert testimony was supported by facts and lay opinion adduced from appellant's 'wife' and his mother.

Dr. William Schwartz, a psychiatrist from Saint Elizabeths Hospital, testified that, in his opinion, appellant was suffering from "a personality disorder, schizoid personality," which "leads to the other problem which he has, ... narcotics addiction." Tr. 19. Dr. Schwartz could not determine, however, whether appellant went through "the physical symptoms of [narcotics] withdrawal" on the date of the robbery, Tr. 29, although he expressed an opinion that, if appellant had been in withdrawal, this would have impaired his behavioral controls. Tr. 31. He also opined that appellant's addiction impaired his behavioral controls, Tr. 32, and that the crimes charged were the product of a mental disease, Tr. 33. He did not explain the nature of the impairment, or of the causal link from disease to crime which he found, until cross-examination, when he stated:

> "he committed the robbery in order to get money to buy narcotics which he needed ... because he was addicted to narcotics. He was an addict as a result of his personality disorder." Tr. 104.

And again, "his schizoid personality led to his narcotics addiction." Tr. 107. "While he is an addict, he is abnormal since he needs the drugs and depends on the drug." Tr. 121. Dr. Schwartz later admitted that appellant's own statements were the source of his conclusion that appellant had undergone withdrawal at the time of the crime, Tr. 136, and that "what part of the narcotics cycle he was in" would "make some difference" "as to his awareness" and "as to how strong this urge was that was driving him towards this crime," Tr. 139.

Dr. John F. Borriello, a clinical psychologist at Saint Elizabeths Hospital, principally testified concerning the results of psychological tests he had administered to appellant. Appellant showed an I.Q. of 75, or "borderline," with "intellectual potential" to function at the higher level of "average," on the Wechsler Adult Intelligence Scale. Tr. 146, 149. The Bender-Gestalt Test showed no organic brain damage, Tr. 146, but the Rorschach, or 'ink blot,' Test results led him to conclude that appellant "was suffering from a severe schizoid personality trait disturbance." Tr.148. On one of the intelligence subtests, appellant showed only "the ability to formulate common-sense judgment ... of a mentally defective individual." Tr. 150.

Dr. Borriello's expertise was substantially underminded by cross-examination which indicated he had graded appellant's test responses in accordance with test manuals, not on the basis of any independent judgment. (See Tr. 153-313.) Nor was he able to articulate his central finding that appellant had "strong dependency needs," the satisfaction of which was central to appellant's behavior. Tr. 318, 321, see also Tr. 331-333. "He could behave in an emotionally labile fashion ... [w]hen he finds that his dependency needs are not being satisfied," Tr. 325. Dr. Borriello also opined that "the drug addiction and the severe schizoid personality are causally related." Tr. 337. Taking drugs "satisfies the strong dependency needs," Tr. 342. "He became a drug addict because of his severe personality disorder." Tr. 355. But the addiction had affected appellant's behavioral controls only "in that specific area" of whether he could take narcotics or leave them alone. Tr. 362. "His behavior controls in relation to the taking of drugs was [sic.] affected." Tr. 373. Because of his schizoid personality, appellant could not bear "the agony of the withdrawal symptoms." Tr. 380.

The Emergency Treatment Record from D.C. General Hospital showed that appellant was treated there for "Heroin withdrawal - mild," being admitted at 4:50 p.m. on February 21 (about twenty hours after his arrest, Tr. 389), at which time he stated, "last shot 36 hours ago." Tr. 386-88.

William Morgenstern, a psychologist at the Lorton Reformatory, testified concerning the Minnesota Multiphasic Personality Inventory and the Lindner-Gurvitz Revised Beta Intelligence Test, which he administered to appellant in June and July of 1960. Tr. 391-93. These tests showed trends toward schizophrenia and paranoia. Tr. 395. He also testified concerning the 34 psychotherapy sessions he had with appellant in 1960, and appellant's fiancee (who held herself out as Mrs. Gaskins, Tr. 423) and mother testified concerning appellant's addiction to narcotics and some of his unusual behavior. Appellant then rested.

The Government's Rebuttal

The Government countered with two psychiatrists from Saint Elizabeths Hospital, followed by two police officers whose testimony indicated that appellant did not display withdrawal symptoms at the time of his arrest.

Dr. Straty H. Economon expressed an opinion that appellant had the "personality type" of "schizoid personality," but not to the extent of mental illness, Tr. 459-60. He and Dr. Borriello did not

> "differ qualitatively, in kind; we differ in amount. The more and more and more that an individual shows of schizoid traits, then he passes a certain borderline and we say he is sick.
>
> "I don't find Mr. Gaskins to be mentally ill. ...I agree with Dr. Borriello but I disagree in terms of calling it a mental illness in this individual." Tr. 461-62.

He explained this difference as follows:

> "I suppose it is [like] a difference between pleasingly plump and fat; and I am not going to answer whether I am fat or not. I like to think of myself as plump."

In answer to hypothetical questions, Dr. Economon opined that appellant was not "suffering from any mental disease or defect on ... the day of the alleged offense," Tr. 465; that he was "actively" addicted to heroin at that time, Tr. 466; and that he was not in withdrawal at the time of the crime: "he must have had a fix recently, just prior to the episode." Tr. 468. Dr. Economon explained the 'narcotics cycle' to the jury, Tr. 470-72, and placed appellant within that cycle, at the time of the crime, thus, Tr. 473:

> "I don't think that an individual committing this type of an offense in the manner in which it was described was on the nod or [? or ?] having a flash or in withdrawal. I don't see that at all. To me, it would be impossible."

In his opinion, appellant was then in the post-fix "extremely long period ... of perfectly rational, reasonable, coherent and normal behavior." Tr. 471.

On cross-examination, Dr. Economon disputed the view that appellant's withdrawal could be mathematically fixed at a particular number of hours after his last fix, Tr. 480-85, reiterating the opinion that "most probably he had had a fairly recent fix and I do not believe he was in withdrawal at the time of the alleged offense." Tr. 486.

Dr. Morris M. Platkin, the physician in charge of the John Howard Division of Saint Elizabeths Hospital, testified in substantially the same terms as Dr. Economon. He thought there was "probably and very likely some connection" between appellant's addiction and the offense, in that "in the search for narcotics, he committed this act in order to get money," IV Tr. 16.*/ He agreed, however, that an addict "is in perfectly good possession of his faculties and he is able to do what he has to pretty much" during "a variable period" between the 'flash' which follows one fix and the withdrawal which may precede the next. IV Tr. 18. "This is the period when he knows what he is doing and he goes about doing what he wants to do." IV Tr. 18. Dr. Platkin "would have to assume," from the fact that appellant did not complain of withdrawal until 20 hours after his arrest, "that prior to that time, he was in an adequate state of control and, gradually, did he begin to experience these symptoms of discomfort." IV Tr. 19. Contrary to Dr. Schwartz's opinion, Dr. Platkin concluded that appellant "was not suffering from a mental disease, or defect," at the time of the crime. IV Tr. 20. "I don't even agree he has a schizoid [kind of] personality." Tr. 23.

---

*/ Volume IV of the transcript, recorded by a different reporter, is separately paginated and is herein cited as "IV Tr.".

On cross-examination, Dr. Platkin drew a parallel between the need for narcotics and the need for food: "The need is always there, but the intensity of it varies depending on how recently you have eaten or satisfied your need and, furthermore, how much avilable you have," IV Tr. 28. The period from fix to withdrawal varies, depending for example on the strength of the particular fix, IV Tr. 30-31, "from 15 hours to 30 hours," IV Tr. 36. An addict who only "feels the withdrawal coming on," however, "is not so overwhelmingly disturbed that he can't act with some degree of rational control." IV Tr. 47. In answer to a hypothetical question on redirect examination, Dr. Platkin stated that at the time of the crime appellant evidently "had not reached that level of desperation where his controls no longer existed,*/ or were very poor." IV Tr. 77. On recross examination, Dr. Platkin referred particularly to appellant's "ability to reason out how to deal with" unexpected developments (such as the telephone ringing) as "not something ... a person, in an extreme state of withdrawal, would do." IV Tr. 82. Furthermore, the crime showed "an organized pattern," IV Tr. 83, and "a man who wants something in a terrible hurry because he is desperate, acts correspondingly in a desperate fashion and not ... a systematized, organized way." IV Tr. 84

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*/ Corrected from "is controls, no longer, existed," an obvious typographical error in the transcript.

Counsel stipulated that a police report indicated that appellant "complained of going into narcotic withdrawals" at 4:20 p.m. on February 21, 1965. IV Tr. 88.

Sergeant William R. Dixon, who had arrested appellant shortly after 9:00 p.m. on February 20, noticed nothing unusual about his condition at that time except that he "appeared excited," and neither then nor at the precinct shortly thereafter had appellant shown any of the classic symptoms of withdrawal, IV Tr. 91-93, listed by Dr. Platkin, IV Tr. 77-80.

Private Harvey B. Kirby, another arresting officer, noticed nothing unusual in appellant's physical condition or behavior either at arrest or during the hour and a half it took him to prepare the necessary papers, nor did appellant complain about "going into a narcotics withdrawal." IV Tr. 98-100.

Charge and Verdict

Judge Corcoran denied appellant's motion for a directed verdict of not guilty by reason of insanity, Tr. 101.

After giving the jury the standard portions of any criminal case instructions, Judge Corcoran gave them detailed instructions on the insanity defense, IV Tr. 116-24. Appellant's counsel asked to "renew my motion on the question of the charge, especially defendant's proposed instruction 2 that narcotic addiction, of itself, may be a mental abnormality, and, of itself, may substantially affect the emotional processes," which was denied. IV Tr. 126.

After a morning's deliberation, the jury requested clarification of two points, one of them "a legal definition of insanity as given by the Court during the charge," Tr. 541. Judge Corcoran, noting "I have discussed this with counsel," gave them a two-sentence definition of the insanity defense, both orally and, "again with the consent of counsel," in written form, "because it is such a technical definition. You may want to refer to it again." Tr. 542.

After about an hour's further deliberation, the jury returned verdicts of guilty on all five counts, Tr. 543.

SUMMARY OF ARGUMENT

This case was tried on the theory that appellant was not guilty by reason of insanity, if at all, because his immediate need for narcotics overwhelmed his reason and compelled him to rob to get money with which to get narcotics. That theory presupposed both a finding that appellant was addicted to heroin at the time, which was conceded, and a further finding on a hotly contested issue: whether he was in such a stage of the addict's cycle of fix, flush, normal feeling, and withdrawal until another fix can be obtained, that his need for narcotics was overwhelming. The evidence on this key point, and on others, was in conflict, so that the case could not be resolved by a directed verdict of not guilty by reason of insanity.

Appellant's theory was accordingly submitted to the jury under an instruction which allowed them to find him not guilty by reason of insanity, without finding an underlying mental disease, if they found that his need for narcotics had overcome his behavioral controls. This was, if anything, more than the law requires, yet appellant objected that the jury had not been instructed that narcotics addiction alone could be the basis for an acquittal by reason of insanity (which was implicit, if not explicit, in the court's charge). No plain error appears in the instructions given, and the judgment should be affirmed.

ARGUMENT

Appellant's defense of insanity was properly submitted to the jury.

The sole question presented by this case is whether it was properly submitted to the jury on the issue of the defense of insanity. Appellee argues first that the trial court should not have submitted the case to the jury at all, but should have directed a verdict of not guilty by reason of insanity, and second that the issue was not properly framed for the jury by the court's instructions. Neither contention has merit.

1. A directed verdict was properly denied

This Court has recently stated that

> "in view of the complicated nature of the decision to be made -- intertwining moral, legal, and medical judgments -- it will require an unusually strong showing to induce us to reverse a conviction because the judge left the critical issue of criminal responsibility with the jury."

King v. United States, ___ U.S. App. D.C. ___, 372 F.2d 383, 389 (1966). In King, the Government rebutted two psychiatrists with nothing but cross-examination and one lay witness' contrary opinion. Here, the Government countered with two psychiatrists; there was a clear split in the testimony; and the resolution of that split was clearly the province of the jury, not of the trial judge.

2. The instruction was proper

Appellant concedes, Brief p. 25, that Judge Corcoran made "a careful effort to properly instruct the jury" on the insanity defense. He argues, however, that the instruction was defective because (1) it permitted the jury to decide "an issue which was conceded, ... causal relation," and (2) Judge Corcoran did not 'connect' "the combined effect of narcotic addiction and mental illness" for the jury.[1]

The first of these arguments simply misstates the record. Neither Dr. Economon nor Dr. Platkin "conceded" a causal relation between appellant's addiction to narcotics and the holdup of February 20, 1965. Indeed, the main thrust of their testimony, aside from their disagreement with Dr. Schwartz and Mr. Borriello as to whether appellant's schizoid tendencies amounted to a mental disorder, was their rebuttal of appellant's theory that he was in withdrawal at the time of the crime, and thus unable to control his actions. See Tr. 466-73 (Economon direct), 479-87 (cross); IV Tr. 16-20 (Platkin direct), 25, 27-33, 38-59 (cross), 74-80 (redirect), 82-86 (recross). Whether there was a causal link between appellant's conceded addiction and the crime was perhaps the most hotly disputed factual issue below. The court could hardly take it away from the jury.

Accordingly, appellant's Proposed Instruction No. 2 was properly rejected solely because it contained the misstatement that "All the psychiatrists who testified ... stated that in their opinion the defendant was actively addicted to narcotics on the date of the crimes, and that those crimes were causally related to the addiction in the sense that he was deprived of narcotics at the time and was under a compulsive need to obtain them and to obtain the money with which to obtain them. The fact of defendant's addiction and the relationship of that addiction to the crimes are not substantially disputed." Could any judge give that instruction after hearing Dr. Platkin and Dr. Economon deny that particular causal link?

---

[1] Appellant's only objection of record below was his request for his "proposed instruction 2 that narcotic addiction, of itself, may be a mental abnormality and, of itself, may substantially affect the emotional processes." IV Tr. 126. His present complaint that the jury should have been instructed on "the combined effect of mental illness and chronic narcotic addiction," Brief p. 27, accordingly runs afoul of the plain error doctrine of Rule 52, F.R. Crim. P.

Moreover, Judge Corcoran's charge framed the insanity issue for the jury precisely as it was framed by the evidence. There was no expert opinion to the effect that appellant's Schizoid Personality Disturbance, if any, directly 'caused' the holdup, only that such a disorder was responsible for appellant's addiction to heroin. Judge Corcoran appropriately skimmed the matter of "underlying mental disease," IV Tr. 118, and centered the jury's attention on appellant's state of mind at the time of the holdup:

> "The key question ... is whether this defendant, at the time he committed the act alleged in the indictment, was suffering from an abnormal condition of the mind and, if so, whether that condition substantially affected his mental or emotional processes and substantially impaired his behavioral control." IV Tr. 118-19.

This was particularly focussed on narcotics in exactly the way appellant's proof had focussed:

> "Now, there has been voluminous testimony ... concerning the narcotic addiction of the defendant. There has also been voluminous testimony as to the effect of narcotic drugs upon the user, and various points of time between the initial taking and the onset of the withdrawal symptoms.
>
> "Narcotic addiction, without something more, does not justify a verdict of not guilty by reason of insanity, since one may be an addict without it affecting his behavior at a given time, or [in] a given way.
>
> "However, you may consider whether the defendant in this case was using drugs at the time of the alleged offense and, if so, whether at the time of the alleged offense, the intake and the effect of the drug so substantially impaired

> his control[2] processes and so substantially affected his behavioral control so that he could not control his common sense at the time." IV Tr. 119-20.

This was appellant's theory, that his addiction caused him to take drugs, and that his immediate lack of heroin at the time of the holdup compelled him to seek funds with which to get heroin to such an extent that he could not restrain himself from robbing Lewis' Five and Ten.

Judge Corcoran's charge was indeed more helpful to appellant than his proposed instruction, which centered on whether appellant's addiction was caused by an underlying disorder. Under the court's charge, the jury did not have to find an underlying disorder. Appellant was scarcely prejudiced by such an instruction.[3]

---

[2] The transcript reads "controlled," an obvious typographical error.

[3] Appellant also contends here, as he did not below, that Judge Corcoran should have responded more fully to the jury's request for "a legal definition of insanity." The record shows, however, not only that appellant failed to object to the Durham-McDonald definition given at Tr. 541-42, but also that he apparently had agreed to it. Judge Corcoran stated "I have discussed this with counsel" just before reading the definition. Tr. 541. Appellee submits that the plain error rule, which appellant must invoke on this point, simply does not fit.

CONCLUSION

WHEREFORE, it is respectfully submitted that the judgment of the District Court should be affirmed.

/s/ DAVID G. BRESS,
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/s/ THOMAS LUMBARD
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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing Brief has been mailed to attorney for appellant, Wayne K. Hill, Esquire, Munsey Building, 1329 E Street, N. W., Washington, D. C. 20004, this 18th day of April, 1967.

/s/ THOMAS LUMBARD
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JOINT APPENDIX

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,255

COMPAGNIE DE SAINT-GOBAIN,
Plaintiff-Appellant,
v.
EDWARD J. BRENNER, Commissioner of Patents,
Defendant-Appellee.

ON APPEAL FROM A JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

United States Court of Appeals
for the District of Columbia Circuit
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Dr. John Stull,
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Civil Action No. 1803-63

Appeal No. 20,255

COMPAGNIE DE SAINT-GOBAIN,

Plaintiff-Appellant,

v.

EDWARD J. BRENNER, COMMISSIONER OF PATENTS,

Defendant-Respondent.

Docket Entries.

July 16, 1963	Complaint filed.
August 21, 1963	Answer filed.
August 22, 1963	Calendered.
June 17, 1964	Trial set for.
	Trial postponed by Court to later date—Notice to be sent.
February 25, 1965	Pre-Trial Brief received.
March 1, 1965	Trial before Judge Joseph R. Jackson.
May 14, 1965	Plaintiff's Brief, Proposed Findings of Fact, Conclusions of Law and Memorandum.
June 9, 1965	Defendant's Brief, Proposed Findings of Fact, Conclusions of Law and Judgment.
June 29, 1965	Plaintiff's Reply Brief.
February 16, 1966	Memorandum Opinion for Defendant and Order entered by Judge Joseph R. Jackson.

February 24, 1966	Plaintiff's Motion to Add Additional Facts.
March 1, 1966	Defendant's Motion for Amendment of Findings.
March 1, 1966	Plaintiff's Motion for Reconsideration and Rehearing and Memorandum.
March 11, 1966	Defendant's Reply on Plaintiff's Motion for Reconsideration and Rehearing.
March 18, 1966	Hearing on Motions—Judge Joseph R. Jackson.
March 24, 1966	Order denying Plaintiff's Motion entered.
March 24, 1966	Order grants Defendant's Motion entered.
May 16, 1966	Notice of Appeal to Court of Appeals. Appeal No. 20255.
June 21, 1966	Record filed.
June 24, 1966	Appellant's Points on Appeal.
June 24, 1966	Appellant's Motion to Extend Time to File Designation of Record and Brief.
June 24, 1966	Motion to Postpone All Further Action.
July 25, 1966	Order Per Curiam sets time to file the Statement of Joint Appendix on September 1 and Appellant's Brief on September 15.

Specification.

This invention relates to optical apparatus, and more particularly to a panfocal lens which is adapted for use, for example, as a corrective lens for the eyes.

The invention has among its objects the provision of an improved simplified panfocal lens.

Another object of the invention resides in the provision of a panfocal lens wherein the variation of the power of the lens is continuous.

Still another object of the invention lies in the provision of a panfocal lens of the type indicated which is easily and economically made.

A still further object is the provision of a panfocal lens which has the two main faces thereof in the form of surfaces of revolution.

The further object of the invention, in one embodiment thereof, is the provision of a panfocal lens which is an astigmatic lens.

Yet another object of the invention, in another embodiment thereof, is the provision of a panfocal lens the two main faces of which provide an effective total astigmatism such that the lens corrects the astigmatism of a given eye.

The above and further objects and novel features of the invention will more fully appear from the following description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and are not intended as a definition of the limits of the invention.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is a view in perspective of a first embodiment of corrective lens made in accordance with the invention;

Fig. 2 is a view in front elevation of the lens shown in Fig. 1;

Fig. 3 is a view in perspective of a second embodiment of corrective lens made in accordance with the invention;

Fig. 4 is a graph showing a typical meridian C of the first or outer main faces of the lenses of Figs. 1 and 3;

Fig. 5 illustrates graphically a first manner of derivation of a meridian C and the axis about which it is to be turned to generate a first main face of a lens according to the invention; and

Fig. 6 is a diagram showing a second manner of derivation of a meridian C of a lens in accordance with the invention and the axis about which the meridian is turned.

As indicated above, the invention relates to a light transmitting device such as a lens having a power which varies in a continuous manner over the broad main faces of the lens. The device is particularly adapted for use as, although not limited to, a corrective eyeglass lens, and will be particularly described with relation to such use. The lens of the invention has both main faces thereof formed as surfaces of revolution; as a consequence the lens may readily be and economically be ground to finished shape. When used as a corrective eyeglass, the lens is preferably so oriented that the zone of greatest power of the lens lies at the bottom thereof, the power of the lens progressively and continuously decreasing in a direction from the bottom to the top of the lens. In the described embodiment the power of the lens in any given horizontal line thereacross is a constant.

The lens of the invention in one embodiment thereof, is anastigmatic, that is, it has no astigmatism per se. Such lens may be advantageously employed to correct farsightedness when the eye to be corrected has no astigmatism. In another embodiment, the panfocal lens of the invention possesses an astigmatism equal to and opposite from that of the eye to be corrected, whereby the lens compensates for both the far-sightedness and astigmatism of the user's eye.

The first embodiment of the lens of the invention is shown in Figs. 1 and 2 of the drawing. Such lens, generally designated 10, has a first or outer main face 11 and a second or inner main face 12. Face 12 is positioned nearer the eye when the lens is in use. As will appear, both surfaces 11 and 12 are surfaces of revolution, surface 11 being formed by the rotation of meridian C thereof about an axis located in a manner to be described, and face 12 being, for example, a portion of the surface of a torus. The lens 10 of Figs. 1 and 2, as indicated in Fig. 2, is so designed that the power of the lens varies continuously from a maximum of 12.5 at the bottom to a minimum of 8 at the top, the power of the lens in any horizontal line being constant. Such lens, which is described as being anastigmatic, is designed for correcting far-sightedness. It accomplishes this by reason of the fact that in close-up reading the eye utilizes the lower part of the lens, and that as one views objects which are progressively further away, zones located higher and higher on the lens are employed. Thus the lens performs essentially the same function as known bifocal and trifocal lenses, and in addition allows for the smooth transition from a zone of greater power to one of lesser power and vice versa. As a result, the lens of the invention is more comfortable to use than are bifocal or trifocal lenses.

The first main face 11 of lens 10 may be defined as being a surface of revolution having a meridian C, the curvature of which varies in a continuous manner, such face having at least one region a constant astigmatism. Such last limitation may be restated by saying that the face "is of such configuration that at all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridian, and in a plane containing the radius R and lying perpendicular to the meridian plane, are different and substantially satisfy the equation:

$$(1)\quad \frac{n-1}{R} - \frac{n-1}{R'} = \text{a constant, } K,$$

K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters.''

In practice the desired constant value of astigmatism can only be approached. That is to say, it is sufficient that the above relationship be satisfied within the tolerances usual for the application to be made of the lens. Thus, for example, for corrective eyeglasses it is usually sufficient if K varies within a range of ¼ diopter. It will be understood that the first main face 11 of the lens defined above may be either convex or concave as required by the use to be made of the lens.

By way of example there is shown in Fig. 4 a meridian C of a first main face 11 of a lens. The meridian C generates the surface 11 when it is rotated about the O-X axis shown in Fig. 4. Let us assume that the glass used for lens 10 has an index of refraction $n = 1.523$, and that the constant astigmatism K of face 11 is 3, that is, three diopters.

By actual experimentation the following are the characteristics of the main face 11 of lens 10. The various powers set forth in the following table are those in the respective horizontal zones of the lens depicted by dotted lines in Fig. 2. The second and third columns of the table set forth, respectively, the Cartesian coordinates in millimeters of points on meridian C in Fig. 4 corresponding to the dotted lines in Fig. 2. The fourth column of the table sets forth the variation at each point of astigmatism from the desired value of 3. It will be seen that in no case does such error exceed 0.02 diopters in the central zone of the lens and 0.1 diopters at the upper and lower edges thereof.

Specification.

Power	X *(mm)*	*y (mm)*	*Deviation of value of K from 3 (diopters)*
8.00	20.413	47.268	+ 0.064
8.12	30.552	46.382	— 0.009
8.25	39.218	44.305	+ 0.007
8.37	43.358	42.840	— 0.018
8.50	48.298	40.640	+ 0.017
8.75	53.824	37.515	+ 0.007
9.00	58.037	34.568	+ 0.002
9.50	63.952	29.340	— 0.014
10.00	68.062	24.643	+ 0.012
10.50	70.640	21.010	— 0.061
10.75	71.545	19.550	— 0.040
11.50	73.849	15.196	— 0.056
12.50	75.551	10.955	— 0.093

The lens 10 of Figs. 1 and 2 is, as indicated, adapted for the correction of far-sightedness. Consequently, the lens as a whole is made anastigmatic. To accomplish this, the second or inner main face 12 is made of such configuration as to have a constant astigmatism which is equal to and of opposite sign from that of the first main face 11. As above indicated, face 12 is a surface of revolution and may, for example, be toroidal in shape.

The lens 14 of Fig. 3 is designed for the correction of astigmatism of the eye as well as far-sightedness of the eye. The first or outer main face of lens 14 is of the same configuration as that of lens 10 and consequently is designated by the same reference character 11. The second or inner face 15 of lens 14, which is also made as a surface of revolution, is a face of constant astigmatism resulting from the composition in a known manner of two faces of constant astigmatism, one of the two component surfaces having an astigmatism, equal to —K, that is, equal to but opposite from the astigmatism of surface 11, and the other of said two component surfaces having an astigmatism equal to and opposite from that of the eye to be corrected.

In the lens 14 shown in Fig. 3 the second face 15 is an astigmatic surface in the form of a portion of a surface of a torus having an astigmatism of 3.16 diopters, one of the principal sectioning planes of face 15 making an angle of 540 15′ with the plane of the meridian C of the first face 11. Such toroidal surface results from the composition of two component toroidal surfaces, one having an astigmatism equal to but on opposite sign from that of the first face 11, that is —3 diopters, and the other of the component toroidal surface having an astigmatism equal to and opposite from that of the eye to be corrected; in an assumed case this might be —1 diopter. Such latter component toroidal surface has its principal sectioning planes making angles of 45° with the principal sectioning planes of the first toroidal component of face 1. It will be seen, therefore, that the assumed lens 14 of Fig. 3 not only corrects far-sightedness but also a corneal or crystalline astigmatism of 1 diopter.

Because both main faces of lenses in accordance with the invention are surfaces of revolution, they are particularly easy to make. The design of the first main face, having a meridian of continuously variable curvature, is readily arrived at. In Figs. 5 and 6 there are illustrated, respectively, two methods by which the shape of such first main face of the lens may be determined.

In the method illustrated in Fig. 5, a suitable curve to form the meridian of continuously variable curvature is chosen in advance, and then the axis of revolution about which such curve must be turned to obtain a surface having a constant astigmatism is determined.

In Fig. 5 there is shown a plane curve C which is continuous and of continuously variable curvature, and which is known by general experience to be satisfactory as a meridian for a first main face of a lens. Two points M_1 and M_2 appreciably spaced from each other on the curve are chosen, and the normals N_1 and N_2 to the curve are erected at such points. It will be apparent that there is a point O_1 on normal N_1 which is the center of curvature of curve C at point M_1, and that there is a point O_2 on normal N_2 which is the center of curvature of the curve at point M_2. A point O_1' is chosen arbitrarily on normal N_1, and a point O_2' corresponding thereto is chosen on normal N_2, the points O_1' and O_2' being such that the following relation is satisfied:

$$(2) \quad \frac{n-1}{O_1 M_1} - \frac{n-1}{O'_1 M_1} = \frac{n-1}{O_2 M_2} - \frac{n-1}{O'_2 M_2} = K$$

In the above equation *n* is the index of refraction of the transparent material of which the lens is made, and K is the constant value of astigmatism of face 11 of the lens. It is obvious that the value of K depends upon the choice of the point O_1'.

A third normal is now erected at the point M_3 of the curve, shown as lying between the points M_1 and M_2. The center of curvature of the curve at point M_3 is point O_3 on normal N_3. The point O'_3 on normal N_3 which satisfies the relation:

$$(3) \quad \frac{n-1}{O_3 M_3} - \frac{n-1}{O'_3 M_3} = K$$

will be found to lie substantially upon the line $O'_1 \quad O'_2$.

It has been found that, in general, the point O'_3 is not located directly upon the line $O'_1 \quad O'_2$ but that it is usually spaced at least slightly therefrom. However, by a judicious choice of the point O'_1, that is to say the value of K, the point of intersection I of the normal N_3 with the line $O'_1 \quad O'_2$ will be located near enough to the point O'_3 for equation (3) to be satisfied, at least within the limits of approximation necessary for the use to be made of the lens, if one replaces in such equation the point O'_3 by the point of intersection I.

The first main face 11 is generated by the rotation of the curve C around the line O'_1 O'_2 as an axis of revolution. The surface thus obtained may be used within certain limits such as those corresponding to the two points A B on portions of the curve beyond points M_1 and M_2, respectively. In general it is necessary only substantially to satisfy equation (1) in the central zone of a lens which is used as an eyeglass, since the borders of the lens are used only infrequently.

In Fig. 6 of the drawing there is illustrated a second method by which the meridian of the first main face 11 of the lens may be chosen. In accordance with such second procedure, a value of the astigmatism K is chosen in advance, and by repeated trials a suitable curve C is chosen. Such curve, as before, has a radius of curvature which varies in a continuous manner, the curve being such as to generate by rotation around an axis the main face of the lens having constant astigmatism. In practice it is not advantageous to choose a high value of K. K usually does not exceed a value of two or three diopters at most.

To determine such a curve C in accordance with such second method the values of R for the different points on the curve as substituted in formula (1). Since the value of K is chosen in advance formula (1) gives the value of R′ and the positioning of the center of curvature O′ for any given point along the curve. More specifically there is chosen for the meridian a curve C for which the centers O′ thus determined lie substantially in a straight line. The curve of course will also be one whose manner of variation of curvature is suitable for the particular use of the lens desired.

Specification.

Turning now to Fig. 6, there is given hereinafter a specific example of the determination of a meridian following the second method.

It will be understood that the power D of the main surface of a lens at a point M is related to the radius R by the formula $D = \frac{n - 1}{R}$. Thus assuming that n is constant, the power D and the radius of curvature R have a unique relationship at each point M of the meridian of the lens face.

To simplify the geometrical construction and the calculations, the meridian is assumed to be made up by the juxtaposition of arcs which are involutes of circles, two consecutive arcs, such as M_1 M_2 and M_2M_3 coincide.

The determination of the meridian is begun by the arbitrary construction of one of the constituent elements of curve C, such as M_1, M_2, which is an involute of a circle having a center C_1 and a radius $P_1 = O_1C_1$. At the points M_1 and M_2 the radii of curvature R_1 and R_2 respectively, lie at an angle Θ_1 with respect to each other.

Since the arc M_1M_2 is an involute of a circle,

$$\Theta_1 P_1 = O_1M_1 - O_2\,M_2$$

The length of radius R_1' (O_1' M_1) may be found, since R_1 (O_1M_1) is known, by use of the formula:

$$\frac{n - 1}{O_1\,M_1} - \frac{n - 1}{O'_1\,M_1} = K$$

In the same manner the length of radius R'_2 ($O_2'M_2$) may be found, since R_2 (O_2M_2) is known, by use of the formula:

$$\frac{n - 1}{O_2\,M_2} - \frac{n - 1}{O'_2\,M_2} = K$$

the axis of revolution is defined by the points O_1' and O_2', which have been determined above.

To extend the curve C, that is, to supply arc $M_2\ M_3$ thereto, there is drawn the arc $M_2\ M_3$ having a radius of curvature R_3 ($O\ M_3$) at point M_3. To determine the location of point O_3, there is taken arbitrarily a radius $P_2 = O_2\ C_2$ on $O_2\ C_1$ which makes an angle with line $O_2\ C_1$. As above, we now have the relationship: $P_2\ \Theta_2 = O_2\ M_2 - O_3\ M_3$, from which the value of $O_3\ M_3$, and thus the location of point O_3 may be found.

But the point O'_3 corresponding to point O_3 does not necessarily fall on the axis $O_1'\ O'_2$.

By repeated trials, there is found a value of P_2 which permits the determination of the proper length of line $O_3\ M_3$, and thus the proper location of point O_3, whereby point O'_3 is located on the axis $O'_1\ O_2'$.

Further parts of curve C may be located in the same way. The locus of the points M constitutes a meridian C which, by revolution around the axis, generates a surface having practically a constant astigmatism at every point.

For other values of powers D_1, D_2, D_3 . . ., that is to say the lengths of radii of curvature R_1, R_2, R_3 . . ., there may be chosen a number of sets of angles θ_1, θ_2 between the normals to C at points M_1, M_2, M_3. . . . There are therefore a plurality of curves C which generate surfaces having the same single value of K. A choice is made among the curves C thus obtained of the one which best serves for the desired correction of vision. It has been assumed that the arcs M_1M_2, M_2M_3, etc.: are involutes of circular arcs for reasons of simplification. Within the scope of the invention there may be used for such arcs involutes of other curves.

In choosing a curve C, the value of the astigmatism due to the obliquity of the luminous rays utilized by the eye should be taken into account. In general it is preferable to leave the residues of astigmatism of the surface to compensate for astigmatism in oblique vision.

Although only a limited number of embodiments of the invention have been illustrated in the accompanying drawings and described in the foregoing specification, it is to be expressly understood that various changes, such as in the relative dimensions in the parts, materials used, and the like, as well as the suggested manner of use of the optical apparatus of the invention, may be made therein without departing from the spirit and scope of the invention as will now be apparent to those skilled in the art.

What is claimed is:

Drawing.

(See opposite ☞)

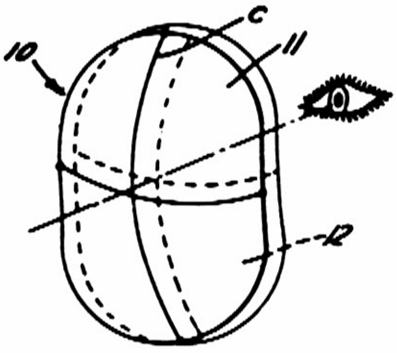

FIG.1

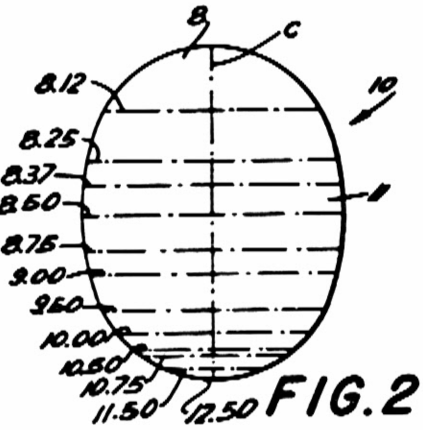

FIG.2

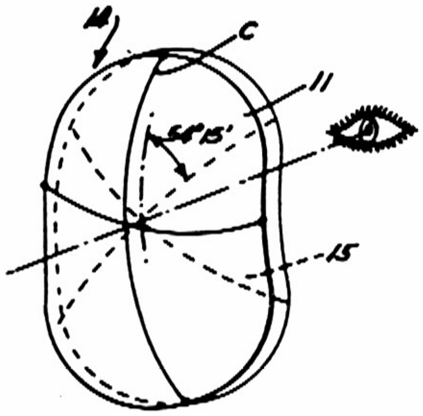

FIG.3

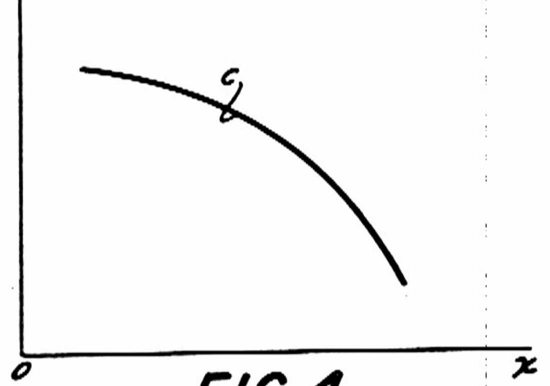

FIG.4

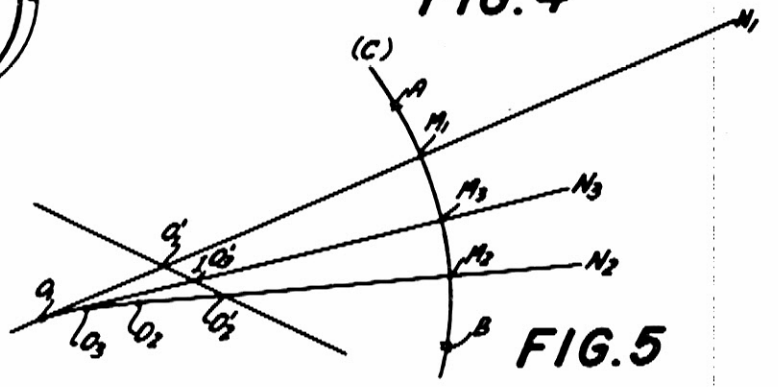

FIG.5

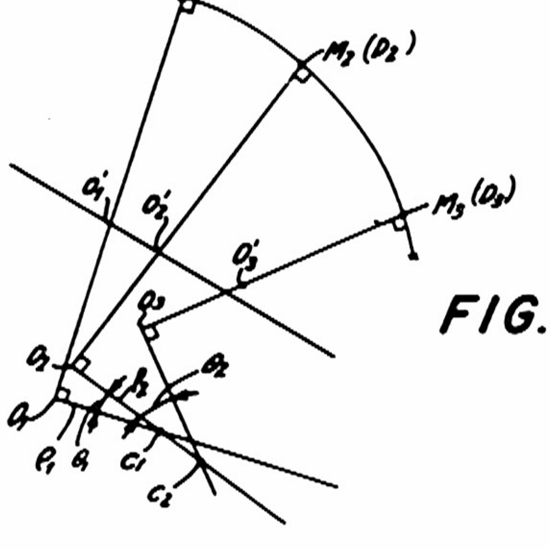

FIG.6

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The Claims at Issue.

1. A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridan whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface.

2. A lens as defined in claim 1 wherein the first face is of such configuration that all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridian and in a plane containing the radius R and lying perpendicular to the meridan plane are different, and substantially satisfy the equation:

$$\frac{n-1}{R} - \frac{n-1}{R'} = \text{a constant, } K,$$

K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters.

5. A lens as defined in claim 2 wherein the lens is adapted to correct astigmatism as well as farsightedness of the eye, and the second face of the lens is an astigmatic surface resulting from the composition of two component surfaces, one of said two component surfaces having an astigmatism equal to —K, and the other of said two component surfaces having an astigmatism equal to and opposite from that of the eye to be corrected.

6. A lens as defined in claim 5 wherein the second lens face has a meridan which has a constant radius of curvature.

The Claims at Issue.

7. A lens as defined in claim 2 wherein the first main face of the lens is developed by rotation of a curved meridian around an axis, the radius of curvature of the meridian being variable, the meridian being composed of a plurality of arcuate segments, the normals to the arcs at their meeting points being coincident.

8. A lens as defined in claim 7 wherein the arcuate segments are involutes of circles.

9. A lens as defined in claim 5 wherein the first main face of the lens is developed by rotation of a curved meridan around an axis, the radius of curvature of the meridian being variable, the meridian being composed of a plurality of arcuate segments, the normals to the arcs at their meeting points being coincident.

10. A lens as defined in claim 9 wherein the arcuate segments are involutes of circles.

12. A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridan whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface, said second face having a constant astigmatism in at least one region of substantial area of its surface which confronts and is aligned with said one region of the first face.

13. A lens as defined in claim 12 wherein the first face is of such configuration that at all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridan and in a plane containing the radius R and

lying perpendicular to the meridan plane are different, and substantially satisfy the equation:

$$\frac{n - 1}{R} - \frac{n - 1}{R'} = \text{a constant, } K,$$

K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters.

Examiner's Answer.

U. S. Department of Commerce
Patent Office
Washington

Appeal No. 461 19
Before the Board of Appeals

In re application of

Guy Bach
Ser. No. 687,821
Filed Oct. 2 1957
For Optical Apparatus

Bauer & Seymour

Examiner's Answer

This is an appeal from the final rejection of claims 1, 2, 5-10, 12 and 13. Claims 3 and 4 have been held to be withdrawn as not readable on the elected species of Fig. 3, in the absence of an allowable generic claim. No claims have been allowed.

A correct copy of the appealed claims 1, 2, 5-10, 12 and 13 appears on pages 4-6 of applicant's brief.

The claimed panfocal or multifocal lens is adequately described on pages 1-4 of applicant's brief.

The references relied on are:

Poullain	1,143,316	June 15, 1915
Evans	2,109,474	Mar. 1, 1938
Jeffree(France)	1,112,429	Nov. 16, 1955

(Corresponding to Jeffree-British patent No. 775,007 May 15, 1957)

BRIEF DESCRIPTION OF THE REFERENCES

Poullain discloses a panfocal or continuously variable multifocal ophthalmic lens having one face with a meridian whose curvature varies in a continuous manner and having curves in planes at right angles to the meridian which may be circular, thereby defining a surface of revolution. The continuously variable curve, as described on page 2, lines 64-92 can be an involute type of curve based on a circle and also may comprise curved sections joined so that they have the same tangent and same curvature at the point of juncture. The circular curves at right angles to the variable curve can be selected to match the instantaneous radius of curvature of the variable curve at the point of intersection, or to differ therefrom (page 1, lines 79-87 and page 3, lines 48-58). The latter paragraph indicates that when unequal values are chosen, a desired amount of astigmatism can be introduced for correcting the patient's astigmatic requirements.

Examiner's Answer.

Evans discloses a continuously variable panfocal ophthalmic lens, again having a continuously variable curve in one meridian to produce a varying lens power along this meridian. The surface is formed as a surface of revolution (page 1, column 2, lines 12-39) and the continuously variable curve may be a circular involute curve or formed as very narrow joined portions of progressively varying circular arcs (page 2, column 1, lines 9-56). As indicated on page 2, column 2, lines 21-30, the circular curves in planes at right angles to the continuously variable curve can differ from the value of curvature of the continuously variable meridian at the point of intersection to provide an astigmatic variable power surface.

Jeffree (British patent specification corresponding to the French Jeffree patent) discusses the problems inherent in continuously variable multifocal lenses (page 1, column 2, lines 56-85), particularly the chief problem of astigmatic *error differences* in different portions of the multifocal surface. As therein indicated, if the horizontal circular curves are made to match the vertical continuously variable curve at the points of intersection, no significant astigmatic error differences result along the vertical center line, but severe errors occur laterally of this line. On the other hand, if the horizontal curves are made less than the instantaneous vertical curves to an appropriate degree, astigmatic errors occur along the vertical meridian. Jeffree's panfocal lens, as described on page 2, lines 51-69 are surfaces of revolution and each surface may be given desired astigmatic power by addition thereto of an cylinder lens surface (see also description on page 4, lines 1-21).

The Rejection of the Claims.

Claims 1, 2, 5-10, 12 and 13 were finally rejected as being based on an insufficient disclosure. Applicant argues this ground of rejection on pages 10 and 11 of the brief, stating that the disclosure is clear as to the manner of making the lens and as to the surface configurations. However, this is not the basis for the Examiner's rejection and applicant's arguments are not considered to be in point. The key question is the one of "constant" astigmatism, alleged to be produced by the disclosed multifocal surface. Thus, it is not seen nor has applicant adequately or clearly established in his disclosure that a multifocal surface, made as described, will in fact have constant astigmatism over a substantial area of its surface, as recited in the appealed claims. Since this is the exact point on which applicant bases his arguments for patentable novelty, it is obvious that his disclosure must, in fact, clearly teach such constant astigmatism for the lens surface defined. As set forth in the final rejection, this is not seen as being the case.

It is first pointed out that applicant's specification, in itself, admits that the astigmatism is not constant, even along the vertical center line c. This is clearly indicated on page 4, lines 15-23 and in the table on page 5, wherein variations are admitted and clearly present, in contradiction to the language of the claims, which unequivocally state that the astigmatism is "constant", which means exactly and not approximately or substantially the same. An analysis of the procedure described on pages 7 and 8 of the specification and shown in Fig. 5 clearly indicates why constant astigmatism cannot be obtained, even along meridian c, since, as indicated, the axis of revolution O_1', O_2', being a straight line, cannot contain all the radii from other portions of the variable curve, this again being admitted on page 8 of the specification. Of course, for positions laterally of the meridian c, the disclosure is entirely silent as to astigmatic values in these areas, it being noted that the table on page 5 is intended to give actual values only on meridian c. It appears clear that "substantial areas" of the lens are recited in the claims and obviously involved in the use of the lens and the mere showing of *substantially* constant astigmatism values only along the vertical center line obviously does not clearly or adequately indicate what the other values are or support assertions that the lens has *constant* astigmatism through substantial areas.

In further connection with the table on page 5, it is noted that the X and Y values are still inconsistent with the statement that the points plotted lie on meridian c. This was discussed in the final rejection, and in the brief (p. 3, lines 9-14) applicant for the first time indicates that these X and Y values are intended to refer to Fig. 4. However, it is clear that they are not consistent with this figure since in Fig. 5, X and Y would both increase as one plotted successive points from left to right along curve c, whereas, in the table, X and Y obviously vary inversely.

Claims 1, 2, 5-10, 12 and 13 are also considered to be indefinite and failing to clearly point out the invention, in that these claims primarily set forth a condition or property which the multifocal lens surface is intended to possess, without clearly defining in structural terms, the specific configuration of such surface which will positively produce the stated property (i.e. constant astigmatism). Thus, these claims merely define the lens surface as a surface of revolution with a continuously variable curve in one meridian and then indicate (claims 1 and 12) that constant astigmatism is produced. The remaining claims further define *points* in the area of constant astigmatism as having constant curvature differences in right angled planes, but it is not seen that this statement establishes or defines a particular surface configuration which would in fact produce constant astigmatism, or would be obtainable with a surface of revolution as defined in the specification or claims.

The Rejection of the Claims.

Claims 1, 2, 5-10, 12 and 13 are further not considered patentable over any one of Pouillain, Evans or Jeffree. Considering first the Pouillain patent, it is clear that this reference teaches a panfocal lens with both faces being surfaces of revolution. One face has a meridian whose curvature varies in a continuous manner and the curvatures in planes at right angles to the meridian plane may be selected to match the curvature of the continuously variable merdian curve at the point of intersection or to differ therefrom. In the first case, with matching curves, the overall theoretical astigmatism would be a constant value of zero and it is not seen that any novel, unexpected or improved results, whether theoretical or actual, are obtained by choosing a fixed difference between the curvatures so that the theoretical power would provide a constant astigmatism. Application on the last page of his brief, indicates that his lens is an improved lens and possesses ease, economy and accuracy of manufacture. As to any improvement, it is not seen that applicant has established that smaller or significantly reduced astigmatic error differences are obtained when the astigmatism (differences between meridian and cross curves) is a constant, as compared to the limiting case, when the curves match and the difference is zero. Merely showing small error differences along the center line, as discussed above, is clearly inconclusive, since substantial areas of the lens are involved. Nor is it seen that similar values would be incapable of being obtained along the center line by follwing the reference procedure and setting R and R′ equal to each other as the limiting case of the fixed difference between these values. The further argument as to ease, economy and accuracy of manufacture is regarded as groundless, since the reference surface, employing circular curves at right angles to the variable meridian curve, is obviously a surface of revolution. It is also to be noted that in applicant's construction, the astigmatism introduced into the multifocal surface generally requires neutralization by a toric back surface, which can hardly be considered an economy or simplification as compared to a nonastigmatic surface.

It is further to be noted that Poullain, in addition to teaching that the curvatures may be equal at each intersection point, also states that they may be unequal. As indicated above, and specifically on page 3, lines 48-58, suitably selected unequal values may be chosen for the correction of astigmatism. Since the correction of astigmatism requires a lens surface having a selected or constant value of astigmatism, this statement is considered to represent an adequiate teaching to anyone of ordinary skill in the art that the curvature difference, insofar as possible with this type of lens surface, be constant at each point, as recited in the claims under appeal. It is further to be noted that in Poullain, astigmatic correction can also be obtained by toric surfaces opposed to the multifocal surface, as is conventional in this art, and no patentable advantage or manufacturing economy or ease is seen in selecting a constant astigmatism for the multifocal surface which differs in power or axis from the patient's prescription and then both neutralizing this astigmatism and incorporating the required astigmatism in a composite rear toric surface, as set forth in claim 5. In this particular case, the advantages of selecting equal curves on the multifocal surface for theoretical zero astigmatism and directly incorporating the astigmatic correction on the opposite surface are deemed obvious.

The rejection of the above claims on Evans involves similar grounds. Again, the Evans multifocal surface is clearly a surface of revolution having a continuously variable curve in one meridian and curves in planes at right angles to the meridian curve which either match or are unequal to the value of the meridian curve at the point of intersection. As set forth above, no patentable advantage or improved result is seen in utilizing a constant difference between the two curves at each point, as opposed to setting them equal, as in Evans. Further, the disclosure in Evans of making the horizontal curves unequal to the vertical curve at each point, for the purpose of introducing an astigmatic correction, is again considered a sufficient teaching to selecting a constant difference between the curve as the obvious manner of approaching, insofar as possible with ammultifocal surface, an overall astigmatic correction.

The rejected claims are further not considered patentable over Jeffree. As described above, the statement on page 1, lines 57-85 of this reference, is considered to represent an accurate description of the relative advantages and disadvantages, as far as unwanted astigmatic error differences, of making the horizontal curves match the variable vertical meridian curve at each point, or making them different (less to an appropriate degree). While these different arrangements can result in improvements along a particular meridian, no overall improvement results in the overall lens, and, particularly for surfaces of revolution, the last sentence in this paragraph of Jeffree is considered an accurate statement of the impossibility of eliminating such astigmatic error differences. Therefore, no significant or patentable improvement is seen to reside in selecting a constant difference in curve values, as compared to matching the curve values. Further, Jeffree on page 2, lines 51-69 and page 4, lines 1-21, teaches a continuously variable multifocal lens surface of revolution to which has been added or composited a second surface having constant astigmatism (cylinder lens) and the resultant composite surface is considered to satisfy the constant astigmatic lens surface as defined in these claims.

For the above reasons, the final rejection of claims 1, 2, 5-10, 12 and 13 is considered proper and should be affirmed.

Respectfully submitted,

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French Patent to Jeffree, No. 1,112,429.

(See opposite ☞)

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BREVET D'INVENTION

Gr. 12. — Cl. 2.
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Lentille optique.

M. John Henry JEFFRÉE résidant en Grande-Bretagne.

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La présente invention concerne une lentille optique perfectionnée, notamment mais non pas exclusivement une lentille convenant particulièrement comme verre de lunettes.

On sait que les verres de lunettes destinés à la correction de la presbytie peuvent recevoir une puissance dioptrique progressivement croissante en partant du bord supérieur ou du milieu vers le bas. A cet effet, la courbure de l'une des faces est un arc méridien à peu près vertical et les courbures dans les plans horizontaux successifs reçoivent des valeurs différentes appropriées, tandis que l'autre face est plane, sphérique ou toroïdale.

Pour simplifier la suite de cette description on supposera que la puissance dioptrique des lentilles en question augmente progressivement vers le bas dans une section méridienne verticale des lentilles telles qu'on les porte, c'est-à-dire dans un plan passant par le centre effectif de pivotement du globe de l'œil dans la direction allant d'avant en arrière. Les courbures, formes des faces des lentilles et les puissances de réfraction de cette section seront désignées respectivement par courbures verticales, formes verticales et puissances dioptriques verticales. Dans le même esprit, les termes courbure horizontale, forme horizontale et puissance dioptrique horizontale désignent respectivement la courbure, la forme et la puissance dioptrique dans une section perpendiculaire au plan vertical précité, et à peu près horizontal, sauf spécification contraire. Les courbures horizontales, formes horizontales et puissances dioptriques horizontales sont celles qui se trouvent à proximité du méridien vertical, sauf spécification contraire. L'utilisation de ces termes simplifiés dans la description n'est naturellement pas destinée à limiter la portée de l'invention aux cas des lentilles portées de cette manière.

En conséquence, dans les lentilles connues jusqu'ici, la courbure verticale de l'une des faces augmente en convexité ou décroit en concavité vers le bas de la lentille, et cette face se présente donc sous une forme non sphérique puisque sa forme verticale n'est pas circulaire. Ces courbures horizontales dans des sections successivement plus basses présentent une augmentation ou diminution correspondante, mais les formes horizontales peuvent être parfaitement circulaires, tout au moins à proximité du méridien.

Si les changements des courbures horizontales et verticales de haut en bas de la lentille présentent la même valeur, il peut en résulter une lentille sans astigmatisme non désiré le long du méridien. Mais on a trouvé qu'une lentille de ce genre présente des aberrations astigmatiques obliques de plus en plus fortes aux points latéraux de plus en plus éloignés du méridien. D'autre part, en choisissant les changements de courbures horizontales inférieurs à ceux des courbures verticales dans une proportion convenable, il est possible d'obtenir des lentilles sans astigmatisme non désiré du type qui augmente aux points latéraux de plus en plus éloignés du méridien, mais avec un astigmatisme non désiré en fonction de la hauteur au-dessus du bord inférieur de la lentille, ces lentilles présentant donc une surface non sphérique sensiblement sur toute l'étendue. Il est également possible d'obtenir des lentilles intermédiaires entre ces deux cas extrêmes, mais les deux défauts ne peuvent généralement pas être éliminés simultanément si on ne prévoit qu'une seule face non sphérique. Ceci résulte de ce que la condition pour l'absence de ces aberrations est à première vue le fait que la courbure de la face non sphérique, quoique variant d'un point à l'autre, doit être la même pour toutes les orientations de la section et en un point quelconque. Il s'agit donc d'une condition qui peut tout au plus être remplie le long de certaines lignes sur une surface, mais non pas dans toute son étendue d'une façon générale.

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Un but de la présente invention est d'éliminer ou tout au moins de réduire sensiblement les aberrations précitées.

Un autre but est de créer une lentille à foyers multiples dont une face au moins est une surface de révolution, ce qui simplifie le façonnage de cette face.

Un autre but est de créer un moyen nouveau et perfectionné permettant d'obtenir la forme finale d'une face de lentille à foyers multiples.

A cet effet, et selon l'invention, on crée une lentille à foyers multiples dont les deux faces donnent une puissance dioptrique augmentant progressivement du haut en bas dans le plan méridien vertical, chaque face étant asphérique et ayant des courbures horizontales supérieures aux courbures verticales.

Les courbures et formes verticales des faces de la lentille selon l'invention sont choisies dans les limites déterminées par la facilité et l'expérience pour donner la puissance désirée, ainsi que la graduation descendante désirée. On peut avantageusement prévoir des courbures faibles, présentant de préférence leur concavité à l'œil. On peut même prévoir pour une face de la lentille une courbure nulle, c'est-à-dire une ligne droite. Il est seulement nécessaire de donner à l'une des faces une forme autre que droite ou circulaire dans le sens vertical. Ainsi qu'il sera expliqué plus loin, ces courbures et formes verticales doivent être fréquemment choisies au cours de la fabrication de la lentille par des opérations d'approximation progressive jusqu'à l'obtention d'une forme finale satisfaisante, opérations qui sont usuelles en optique. Néanmoins, on peut choisir diversement pour chaque cas particulier. En revanche, les courbures horizontales sont relativement rigoureuses pour les deux faces, avec les concavités présentées à l'œil. Elles sont de préférence telles, (à proximité du milieu de la lentille), que la moyenne arithmétique des deux rayons de courbure horizontale soit du même ordre que la distance entre ledit milieu et le centre de pivotement du globe de l'œil, c'est-à-dire de l'ordre de trois centimètres. De plus, à proximité du milieu, les faces de la lentille sont de préférence inclinées l'une par rapport à l'autre de façon que l'épaisseur de cette lentille augmente progressivement vers le bas, le degré d'inclinaison étant avantageusement à peu près le maximum qu'il soit possible de choisir sans introduire des défauts nuisibles de décomposition de la lumière dans le champ de vision. De plus, les courbures horizontales des deux faces augmentent généralement vers le bas de la lentille, et ce de façon que leurs rayons soient de l'ordre de un à deux centimètres à proximité du bord inférieur.

Les lentilles les plus simples selon l'invention sont celles dont les deux faces sont des surfaces de révolution. D'une façon générale, étant donné qu'on doit introduire des corrections d'astigmatisme, les faces sont avantageusement celles qui résultent de surfaces de révolution retouchées par une correction astigmatique dans une proportion convenable. Par « correction astigmatique » d'une surface, on entend dans ce cas qu'on établit une surface en partant d'une surface donnée en traçant une ligne perpendiculaire à la surface donnée en un point quelconque, et en augmentant ou en diminuant la hauteur de chaque autre point de la surface, dans le direction de ladite ligne perpendiculaire, d'une quantité à peu près proportionnelle au carré de la distance de chacun de ces autres points en partant d'un plan choisi contenant la ligne perpendiculaire.

Les surfaces de révolution en partant desquelles on peut établir les surfaces réelles de la lentille sont de préférence telles que leurs axes soient situés dans un plan commun qui est celui d'une section verticale méridienne, telle que définie précédemment, et qui contient donc le centre effectif de pivotement du globe de l'œil, qu'on appellera le centre de l'œil. On trouve alors que, pour les lentilles les plus avantageuses, les axes sont inclinés de 40 à 90° par rapport à l'horizontale.

On décrira ci-après des modes de mise en œuvre préférés de l'invention en regard du dessin annexé sur lequel :

La fig. 1 montre les positions préférées desdits axes dans une section verticale méridienne.

La fig. 2 montre un certain nombre de coupes horizontales de la lentille représentée sur la fig. 1.

La fig. 3 montre une coupe de la lentille selon l'invention combinée avec une lentille de forme connue.

Sur la fig. 1, le centre de l'œil est indiqué en 11, tandis que la face postérieure de la lentille est désignée par 12. On choisit approximativement et provisoirement la forme verticale et la courbure verticale de cette face, et on trace une perpendiculaire 13 à cette face en partant du centre de l'œil et en passant par le point d'intersection 14. En ce point, on détermine provisoirement, arbitrairement ou par expérience, la courbure horizontale de la face, en situant par exemple le centre de courbure horizontale au point 15 sur la ligne 13.

En partant de l'incide de réfraction du verre de lentille et de ladite courbure horizontale, on détermine par le calcul optique usuel la position de l'image virtuelle du centre de l'œil formée par les rayons réfractés à la surface dans un plan horizontal passant par la ligne 13 et à proximité du point 14. Cette position s'établit au point 16, qu'on appellera le centre virtuel de l'œil. La ligne perpendiculaire 13 est prolongée pour intersecter la face antérieure 17 de la lentille au point 18, on détermine la courbure horizontale de cette face antérieure en ce point pour donner la puissance dioptrique horizontale désirée à la lentille. On détermine également arbitrairement ou par expérience une inclinaison appropriée de la face antérieure par rapport à la face postérieure en ce point. On trace une ligne perpendiculaire 19 partant de ce point de la face. La position du centre de courbure horizontale de la face s'établit ainsi en 20.

On choisit également, arbitrairement ou par expérience, pour la face antérieure une forme verticale et une courbure verticale approximative. Par rapport à la face postérieure cette forme et cette courbure doivent être telles qu'elles donnent à la lentille à peu près la puissance dioptrique verticale désirée ainsi que sa graduation. Par calcul algébrique, c'est-à-dire en unités appropriées quelconques, avec des signes conventionnels également appropriés, on détermine ensuite les quantités indiquées ci-après de façon que les distances mesurées en partant des centres de courbure vers l'avant et vers l'arrière aient des signes opposés, pour l'obtention de courbures présentant leur convexité vers l'avant ou vers l'arrière.

La courbure verticale moyenne A de la face postérieure.

La courbure verticale moyenne B de la face antérieure.

La distance L entre le centre de courbure horizontale postérieure 15 et le centre virtuel 16 de l'œil.

Le rayon de courbure horizontale M de la face postérieure sur la ligne 13.

Le rayon de courbure horizontale N de la face antérieure sur la ligne 19.

Sur la perpendiculaire 19 à la face antérieure, on situe ensuite un point 21 à une distance du centre 20 égale à LAM/BN, et on fait passer par ce point et le cenrte virtuel 16 de l'œil un arc de cercle 22 ayant un rayon de courbure égal à AL/M, dont les points d'intersection avec les faces postérieure et antérieure sont respectivement situés en 23 et 24. On peut alors adopter ces points comme les pôles des surfaces de révolution désirées sur les faces postérieure et antérieure. Toutefois si les formes verticales initialement choisies sont loin d'être circulaires, il est préférable d'adopter comme pôles les points d'intersection de l'arc de cercle 22 en 25, 26 respectivement avec des surfaces postérieure et antérieure fictives 27, 28, ayant des formes verticales circulaires avec des rayons de courbure égaux aux valeurs moyennes A, B, et qui sont tangentes aux faces réelles à proximité du milieu de la lentille utilisée.

Dans tous les cas les pôles en question, avec les centres de courbure 15, 20 et les formes verticales choisies, déterminent les surfaces de révolution, et on peut alors calculer le rendement d'une lentille ainsi formée pour tous les pinceaux de lumière passant par le centre de l'œil. En général ceci n'est nécessaire que pour les pinceaux de lumière dans la section verticale en question, et on peut ainsi vérifier jusqu'à quel point les puissances dioptriques verticale et horizontale coïncident aux différents points avec ce qu'on désire. On procède ensuite à des modifications appropriées des paramètres du dessin et on répète l'opération jusqu'à ce que le résultat désiré soit obtenu. La localisation des axes de la manière décrite suffit pour qu'une première approximation assure que le rendement trouvé pour la section méridienne soit également maintenu à l'extérieur de celle-ci.

Pour l'opération géométrique précitée on a utilisé les courbures verticales moyennes des faces de la lentille. La longueur pour laquelle la moyenne est calculée peut être la longueur méridienne de la lentille finale réelle ou d'une partie de cette lentille. Il n'est pas nécessaire de déterminer cette longueur plus exactement, étant donné que l'utilisation d'une valeur moyenne de ce genre entraîne un léger défaut de précision dans l'opération de traçage. D'une façon générale, ce défaut de précision ne présente pratiquement pas une grande importance, à condition que la valeur moyenne de courbure verticale soit choisie pour être proche de la moyenne des valeurs extrêmes pour la partie utilisée de la surface, et à condition que les formes verticales soient choisies pour être aussi circulaires que possible.

Il existe cependant deux cas spéciaux pour lesquels ce défaut de précision est évité, c'est-à-dire lorsque la face antérieure ou la face postérieure est conique, la courbure verticale étant alors égale à zéro. Si c'est le cas pour la face postérieure, les formules précitées montrent que la distance entre les points 20 et 21, qui est proportionnelle à cette courbure, doit être égale à zéro, c'est-à-dire que l'arc de cercle 22 passe par le centre de courbure horizontale de la face antérieure. La courbure de l'arc 2 est également réduite à zéro puisqu'elle est également proportionnelle à la courbure verticale de la face postérieure. Si la face antérieure est conique, la distance L entre les points 15 et 16 doit être choisie égale à zéro pour éviter que la distance entre les poins 20 et 21 ne devienne infinie, c'est-à-dire que l'arc 22 passe alors par le centre de la courbure horizontale postérieure, tandis que sa courbure est encore égale à zéro puisqu'elle est proportionnelle à la distance L. Dans chacun de ces cas, le centre virtuel de l'œil est situé sur l'axe de la face dont la courbure verticale n'est pas égale à zéro, et la valeur exacte de la courbure verticale de cette face ne présente aucune importance pour la localisation des axes. Ces cas spéciaux représentent donc des formes fondamentales donnant une liberté complémentaire pour le traçage, et convenant à l'application pratique dans de nombreux cas.

Les lignes 29, 30, 31 de la fig. 1 indiquent des plans de coupe horizontale d'une lentille constituée de la manière décrite. Les coupes correspondantes de cette lentille sont représentées sur la fig. 2 en 32, 33, 34. Une lentille ainsi constituée peut servir sans autre modification, si aucune correction ne doit être introduite pour l'astigmatisme de l'œil. Lorsque ces corrections sont nécessaires, on peut les superposer à l'une ou à l'autre face de la lentille de la manière précédemment décrite.

Lorsqu'il faut introduire des corrections importantes d'astigmatisme, il se peut que la forme de lentille résultant de ces corrections complémentaires soit capable d'assurer une amélioration du rendement par des modifications donnant de légers écarts par rapport à la forme déterminée par les indications précédentes. Ceci résulte de la présence, comme dans tous les appareils d'optique, d'aberrations d'un ordre supérieur à celles dont il a été tenu compte pour l'opération fondamentale de traçage. Bien entendu, la correction des aberrations d'un ordre supérieur, qui est usuelle pour tous les systèmes optiques, et qui a lieu par de faibles écarts par rapport à la forme déterminée par des considérations fondamentales, peut avoir lieu dans le cadre de la présente invention.

Les lentilles selon l'invention sont avantageusement faites par moulage d'une matière plastique transparente. On peut également les faire à la meule ou par des procédés d'usinage connus, en verre, matière plastique ou similaires. Les matrices pour le moulage des lentilles peuvent être facilement fabriquées par les procédés de meulage et d'usinage connus tant qu'il n'est pas nécessaire d'introduire des corrections d'astigmatisme pour les surfaces de révolution nécessaires aux formes les plus simples. Lorsqu'il faut ajouter des corrections d'astigmatisme, il est souvent plus avantageux de confectionner un modèle d'une surface de révolution appropriée en matière plastique ou autre, et d'appliquer sur ce modèle une lentille cylindrique faite en matière flexible telle que la gélatine humide, au besoin avec un adhésif approprié pour la coller à la surface du modèle. L'opération de la correction astigmatique est ainsi effectuée mécaniquement. En partant de la surface résultante et corrigée, on peut ensuite confectionner une matrice métallique de façonnage par voie électrique ou d'une manière similaire.

Dans certains cas, et selon l'invention, on peut obtenir des lentilles avec des corrections astigmatiques en partant des mêmes surfaces de révolution, et avec les mêmes matrices pour le moulage, telles qu'on les utilise pour les lentilles sans corrections astigmatiques, et ce par un léger déplacement d'une matrice ou surface par rapport à l'autre. Par exemple si on déplace l'une des faces par rapport à l'autre dans la direction d'une section verticale méridienne, on introduit un certain degré d'astigmatisme avec des axes verticaux ou horizontaux. Si on choisit des formes verticales appropriées pour les faces, ce degré d'astigmatisme peut être constant par première approximation dans toute la lentille. Si on fait tourner l'une des faces par rapport à l'autre dans un plan tangent à la zone centrale, on introduit l'astigmatisme sur des axes inclinés de 45 degrés par rapport à la verticale. On peut ainsi effectuer une gamme étendue de corrections par ces déplacements en faisant varier les degrés.

La fig. 3 représente une lentille en deux éléments, dont moitié supérieure 35 ou une partie plus importante présente des faces formées et disposées de la manière décrite, et est raccordée à une autre partie 36 ayant d'autres formes et d'autres dispositions des faces, par exemple avec une puissance dioptrique constante vers le bas dans le plan méridien vertical. Une lentille composée de ce genre peut présenter une puissance dioptrique augmentant progressivement vers le bas dans l'élément supérieur, et augmentant ensuite davantage dans l'élément inférieur. On peut également choisir une disposition telle qu'il n'existe aucune solution de continuité du champ apparent de vision lorsque le regard passe d'un élément à l'autre. Par exemple, si les surfaces de l'élément supérieur sont à peu près des surfaces de révolution, les surfaces de l'élément inférieur peuvent être à peu près des sphères, les centres des faces antérieure et postérieure étant situés sur les mêmes axes respectifs. Si on choisit convenablement les formes de l'élément supérieur et la puissance de l'élément inférieur, il est souvent possible de choisir la disposition de façon qu'il n'existe aucune discontinuité dans le champ apparent de vision. Pour corriger à peu près cette discontinuité lorsqu'elle existe, on peut déplacer le centre de l'une ou des deux faces à peu près sphériques de l'élément inférieur vers l'avant ou vers l'arrière en partant de l'axe approprié de l'élément supérieur. Dans ces formes combinées, les faces des éléments supérieur et inférieur forment entre elles généralement un angle plus ou moins aigu. On peut imaginer une grande diversité de ces formes combinées qui sont caractérisées par le fait qu'une partie de la lentille est faite selon les indications de la description.

RÉSUMÉ

1° Lentille à foyers multiples à deux faces et dont la puissance dioptrique augmente progressivement de haut en bas dans le plan vertical méridien, chaque face étant asphérique et ayant des courbures horizontales supérieures aux courbures verticales;

2° La moyenne arithmétique des rayons de courbure horizontale des deux faces, à proximité du milieu de la lentille, est à peu près égale à la distance entre ce point milieu et le centre de l'œil;

3° Les courbures horizontales des deux faces augmentent positivement de haut en bas dans le plan vertical méridien;

4° L'épaisseur de la lentille augmente de haut en bas dans le plan vertical méridien;

5° Chaque face est une surface de révolution dont l'axe de révolution est situé dans le plan vertical méridien;

6° Chaque axe de révolution est incliné de 40 à 90° par rapport à l'horizontale;

7° Chaque axe de révolution est déterminé de la manière suivante : On trace une ligne perpendiculaire à la face postérieure et passant par le centre de l'œil et à travers les deux faces de la lentille, on détermine aux points d'intersection les courbures horizontale et verticale approximatives et les inclinaisons relatives approximatives des deux faces, on détermine sur la perpendiculaire de la face postérieure le centre virtuel de l'œil par rapport à la face postérieure, on détermine le centre de courbure horizontale sur une perpendiculaire à la face antérieure audit point d'intersection de cette face antérieure, on détermine sur la perpendiculaire la face antérieure un point à une distance égale à LAM/BN du point d'intersection antérieur, on trace par ce point et le centre virtuel de l'œil, un arc de cercle d'un rayon de courbure AL/M qui intersecte les deux faces aux pôles des surfaces de révolution nécessaires;

8° L'une des faces reçoit un complément de courbure pour la correction des aberrations astigmatiques;

9° L'une des faces est conique.

JOHN HENRY JEFFREE.

Par procuration :

BLÉTRY.

Pour la vente des fascicules, s'adresser à l'IMPRIMERIE NATIONALE, 27, rue de la Convention, Paris (15e).

Nº 1.112.429 M. Jeffrée Pl. unique

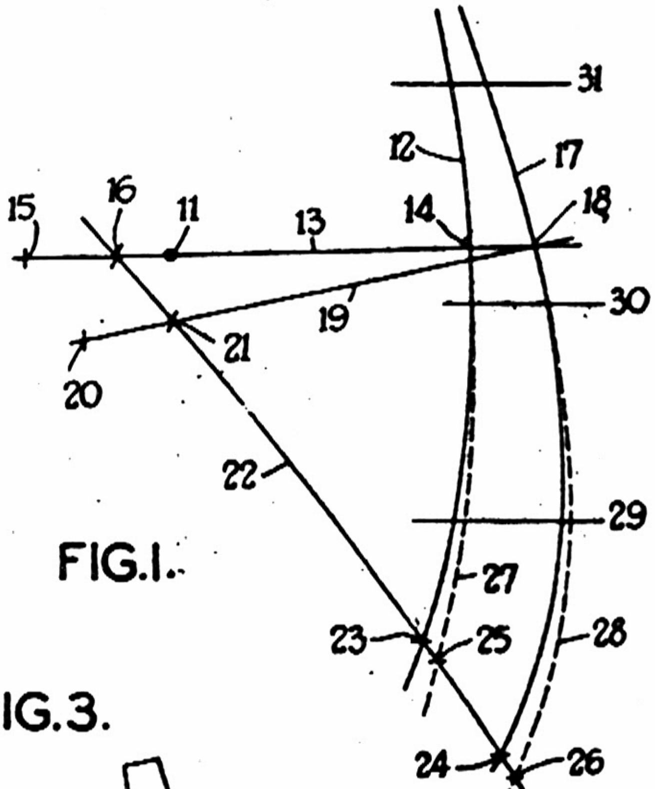


FIG.1.

FIG.3.

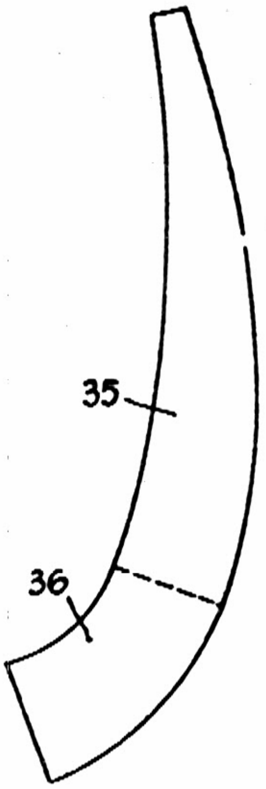
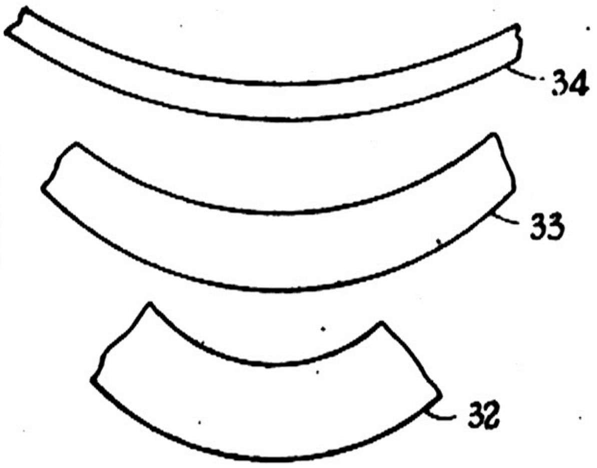


FIG.2.



PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Lenses

I, JOHN HENRY JEFFREE, a British Subject, of Woodcot, Woodside Road, Cobham, Surrey, England, do hereby declare the invention, for which I pray that a patent may be granted to me and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an improved lens and, although not exclusively limited thereto is particularly suitable for use as a spectacle lens.

Spectacle lenses for the relief of presbyopia can, as is known, be made with gradually increasing positive power from the top or from the middle of the lens towards the bottom. For this purpose the curvature of one of the surfaces in an approximately vertical meridianal section and its curvatures in successive horizontal sections are made of suitably changing amounts, the other surface being plane, spherical or toroidal.

For the sake of simplicity in what follows the direction of increasing positive power in the lenses discussed will be assumed to be downwards in a vertical meridianal section of the lens as worn, i.e., in a plane passing through the effective centre of rotation of the eyeball (hereinafter called the eye centre) in the forward-backwards dirction. The curvatures, forms of the lens surfaces and refractive powers of the lens, in this section, will be called the vertical curvatures, vertical forms and vertical powers respectively. Correspondingly, the terms horizontal curvature, horizontal form and horizontal power will signify curvature, form and power in planes of section perpendicular to the aforesaid vertical plane and approximately horizontal unless otherwise specified; and such horizontal curvatures, forms or powers will be those near the vertical meridian unless stated otherwise. But the use of these simplifying assumptions in the description is not intended to limit the invention to cases where the lenses are worn only in this manner.

Accordingly, using this nomenclature, in the known lenses previously referred to, the vertical curvature of one of the surfaces increases in convexity, or decreases in concavity, towards the bottom of the lens, and this surface is therefore of non-spherical form since its vertical form is non-circular. Its horizontal curvatures in successively lower sections show a corresponding increase or decrease, but the horizontal forms, at least near the meridian, may well be circular.

If the changes in horizontal and vertical curvatures down the lens are of the same magnitude, there can result a lens with no unwanted astigmatism along the meridian, but such a lens proves to have increasingly severe oblique astigmatic errors at increasing distances from the meridian laterally. On the other hand it is possible, by making the changes in horizontal curvatures less than that of the vertical curvature to an appropriate degree, to produce lenses with no unwanted astigmatism of the type that increases with lateral distance from the meridian, but instead, with unwanted astigmatism dependent on height from the bottom of the lens and therefore present over substantially all the area of the non-spherical surface. A variety of compromises between these two typical cases is also possible, but the two types of defect cannot in general be removed simultaneously when only one non-spherical surface is used. This is because the condition for absence of any such errors is, to a first approximation, that the curvature of the non-spherical surface, while varying from point to point, shall be the same for all directions of section, at any single point; a requirement which can, at most, be met along certain lines on a surface but not over its area generally.

It is an object of this invention to eliminate or at least reduce substantially, the errors above referred to.

A feature of the invention is the provision of a multifocal lens at least one surface of

[Price 3s. 6d.]

which is a surface of revolution, so that the production of the surface is simplified.

Another feature is the provision of a novel and improved geometrical construction of the final shape of a multifocal lens surface.

In accordance with the invention, there is provided a multifocal lens having its positive power increasing gradually from top to bottom in the vertical meridianal plane, each surface being aspherical and having, for each point on both of its surfaces, the horizontal curvature greater than the vertical curvatures.

The vertical curvatures and forms of the lens surfaces in this invention are chosen within limits set by convenience and experience, to give the desired power, and the desired downward gradation thereof, to the lens; they may conevniently be slight curvatures, preferably concave towards the eye, or even, for one surface of the lens, zero curvature, that is a straight line, and it is only necessary for one of the surfaces to depart from a straight or circular vertical form. As will be explained below, these vertical curvatures and forms frequently need to be chosen, in the course of design of the lens, by processes of gradual approach to a satisfactory final design, such as are well-known in optical work; but nevertheless there are a variety of choices in any particular case. The horizontal curvatures, however, are comparatively strong for both surfaces, preferably with the curves concave towards the eye and are preferably such, near the centre of the lens, that the arithmetic mean of the two radii of horizontal curvature are approximately equal to the distance from the lens to the eye centre that is, of the order of three centimeters. Near the middle of the lens, moreover, the lens surfaces are preferably so inclined to each other that the lens thickness increases downwards, the amount of inclination being conveniently about the maximum that is possible without introducing objectionable defects of prismatic colour into the field of view. Further, the horizontal curvatures of both surfaces commonly increase towards the bottom of the lens, so that near the bottom their radii of horizontal curvature may be of the order of one to two centimeters.

The simplest lenses according to this invention are those wherein both surfaces are surfaces of revolution. In general, since corrections for visual astigmatism have to be incorporated, the surfaces are conveniently those that are derived from surfaces of revolution by the addition thereto, as specified below, of suitable amounts of astigmatic correction. By such addition of astigmatic correction to a surface is meant, that from a given surface another surface is derived by the process of drawing a line perpendicular to the given surface at some point, and then increasing or decreasing the height of every other point of the surface, in the direction of the said perpendicular line, by amounts approximately proportional to the square of the distance of each said other point from a chosen plane containing that perpendicular line.

The surfaces of revolution from which such actual lens surfaces can conveniently be derived are preferably such that their axes lie in a common plane which is that of a vertical meridianal section as previously defined and which therefore contains the effective centre of rotation of the eyeball, hereinafter called the eye-centre. It will be found that for most useful lenses the axes lie inclined to the horizontal between angles of 40° and 90°.

Preferred forms of the invention will now be described with reference to the drawings accompanying the provisional specification and to the accompanying drawing, in which:—

Figure 1 illustrates the preferred location of the said axes within a vertical meridianal section.

Figure 2 illustrates a number of horizontal sections through the lens of Figure 1, and

Figure 3 is a section through a lens made accordance with this invention and joined t a lens of known form.

Referring to Figure 1, the eye-centre is shown at 11 and the rear surface of the lens at 12. The vertical form and curvature of this surface being approximately or provisionally chosen, a perpendicular 13 is drawn to it, from the eye centre, meeting the surface at 14. The horizontal curvature of the surface at this point being provisionally determined arbitrarily or from experience, or, if the lens is a spectacle lens, so that the arithmetic mean of the horizontal curvatures will be of the order of three centimetres, its centre of horizontal curvature is located at 15 on the line 13.

From the refractive index of the lens material and the said horizontal curvature the position of the virtual image of the eye centre as formed within the material by rays refracted at the surface in a horizontal plane through line 13 and rear point 14 is determined by known optical theory as point 16; this point is hereinafter called the virtual eye centre. The perpendicular line 13 being produced to cut the front surface 17 of the lens at point 18, the horizontal curvature of the front surface at this point is determined to give the desired horizontal power to the lens there, and a suitable inclination of the front to the rear surface at this point is also determined arbitrarily or from experience. A perpendicular line 19 is drawn to the front surface at this point, and the position on it of the centre of horizontal curvature of the surface is located at 20.

An approximate vertical form and curvature is also chosen for the front surface, arbitrarily or from experience, being so related to those of the rear surface as to give approximately the desired vertical power and gradation thereof to the lens. There are then determined the following quantities algebraically, that is to say, in any convenient units with any consistent sign convention so that distances measured from centres of curvature forwards or backwards are of opposite signs, and similarly curvatures which are convex forwards or backwards:—

The mean vertical curvature of the
rear surface in the meridianal plane=A
The mean vertical curavture of the
front surface in the meridianal plane=B
The distance from the centre of rear
horizontal curvature, 15, to the virtual eye-centre, 16 - - - - - =L
The radius of horizontal curvature,
rear surface, on 13, at the point of
intersection, 14 - - - - - - =M
The radius of horizontal curvature,
front surface, on 19, at the point of
intersection, 18 - - - - - - =N

There is then located on the perpendicular 19 to the front surface, a point 21 at a distance from the centre 20 thereon equal to LAN/BM and through this point and the virtual eye-centre 16 there is drawn an arc 22 with curvature equal to AL/M which arc is produced to cut the rear and front surfaces at points 23, 24 respectively. These points may then be taken as the poles of the desired surfaces of revolution at rear and front respectively; but if the originally selected vertical forms are far from circular it is preferable to take, as the said poles, the intersections of the arc 22 at points 25, 26 respectively with fictitious rear and front surfaces 27, 28 which have circular vertical forms with curvatures equal to the mean values A, B, respectively and are tangential to the actual surfaces near the middle of the lens used. Points 15 and 23 or 25, 20 and 24 or 26 then define the axes of revolution of surfaces 11 and 17 respectively.

In either case the said poles, with the centres of horizontal curvature 15, 20 and the vertical forms chosen, determine the surfaces of revolution, and the performance of a lens so formed for any pencils of light passing through the eye-centre can then be calculated. It is in general only necessary to do this for pencils in the vertical section so far considered, and thereby to discover how nearly the vertical and horizontal powers at various points agree with what is desired. Appropriate alterations are then made to the design parameters and the process repeated till the desired result is achieved. The location of axes in the manner that has been described suffices to ensure that, to a first approximation, the performance found for the meridianal section will also be maintained outside it.

In the above design process reference has been made to the mean vertical curvatures of the lens surfaces. The length over which the mean is calculated may be the meridianal length of the actual final lens or a portion of it. It is not necessary to fix this length more precisely, since the use of such a mean value at all implies a slight lack of precision in the design process. But in general this lack of precision is not of great practical importance so long as the mean value of vertical curvature is taken to lie near the mean of the extreme values for the part of the surface used, and if the vertical forms are chosen to be as nearly circular as possible.

There are however, two special cases where the above lack of precision is avoided, namely, those where either the front or the rear surface is conical, so that its vertical curvature is zero. Where this is true of the rear surface, it can be seen from the foregoing formulæ that the distance between the points 20 and 21, being proportional to this curvature, must be zero; that is, the arc 22 passes through the centre of horizontal curvature of the front surface; and the curvature of the arc 22 is also zero, being proportional also to the rear surface vertical curvature. Where it is the front surface that is conical, the distance L between points 15 and 16 must be zero to avoid making the distance between points 20 and 21 infinite; the arc 22 then passes through the centre of rear horizontal curvature; its curvature is again zero, being proportional to the distance L and its inclination to the line 19 may have any convenient value. In either of these cases the virtual eye centre lies on the axis of that surface whose vertical curvature is not zero, and the exact value of the vertical curvature of that surface is of no importance for the location of the axes. These special cases therefore represent basic forms providing added freedom of design and convenient for practical application in many instances.

The lines 29, 30, 31 in Figure 1 indicate planes of horizontal section of a lens designed as above described, and the corresponding sections of such a lens are illustrated in Figure 2 at 32, 33, 34 respectively. A lens so designed may be used without further modification when no corrections for visual astigmatism are required to be incorporated; as previously explained, when such corrections are required they are added to one or other surface of such a lens.

It can happen in cases where large corrections for astigmatism have to be incorporated, that the lens from resulting from addition of such corrections proves subsequently capable of improvement in performance by modifications amounting to slight departures from the form determined according to the above directions. This arises from the presence, as in all optical apparatus, of aberrations of higher order than those taken into account in the basic design process, and the correction of such higher order aberrations, which is usual in all optical design, by slight departures from the form determined by basic considerations naturally does not constitute a departure from the invention here described.

Lenses according to this invention are conveniently made by moulding in transparent plastic materials, and may also be made by grinding and machining processes of known type, in glass, plastics or other materials. Dies for moulding such lenses can, when no astigmatic corrections have to be added to the surfaces of revolution required for the simplest forms, be readily made by known methods of machining and grinding. Where astigmatic corrections have to be added it is often more convenient to make a model of a suitable surface of revolution in plastic or other material, and lay over this a cylindrical lens made in a flexible material such as moist gelatine, with a suitable adhesive if necessary to cement it to the model surface. The process of adding an astigmatic correction within the meaning aforesaid is thus effected mechanically, and from the resulting corrected surface a metal die may then be made by known electro-forming or similar processes.

In certain cases lenses incorporating astigmatic correction can be made according to this inevntion with the same surfaces of revolution, and, if moulded, from the same dies, as are appropriate for lenses with no astigmatic corrections, by slight displacements of one die or surface relative to the other. For instance, if one of the surfaces be displaced relative to the other along the direction of a vertical meridianal section, a degree of astigmatism with vertical or horizontal axes is introduced, which can, if suitable vertical forms be chosen for the surfaces, be constant to a first approximation over the whole lens. Again, if one of the surfaces be rotated relative to the other in a plane tangential to its central region, astigmatism about axes inclined at 45 degrees to the vertical is introduced. A considerable range of corrections can be made by combinations of such displacements in varying degrees.

In Figure 3 is illustrated a two-part lens, the upper half 35 or more of which has surfaces formed and arranged as has been described, and is joined or contiguous with another part 36 having other forms and arrangements of surfaces, for instance of constant power downwards in the vertical meridianal plane. Such a composite lens can have power increasing gradually down the upper half and then becoming markedly greater in the lower half. It can also be so arranged that there is no discontinuity in apparent field of view as the line of sight passes from one half to the other. For instance, if the surfaces of the upper half approximate to surfaces of revolution, the surfaces of the lower half may approximate to spheres with centres on the same respective axes, front and rear, as those surfaces, and it is often possible, with suitable choice of forms for the upper half and of power for the lower half, to arrange that there is no discontinuity in apparent field of view. Or again, to correct such discontinuity approximately, the centre of one or both of the approximately spherical surfaces of the lower half may be displaced forwards or backwards from the appropriate axis of the upper half by a suitable amount. In such compound forms the surfaces of the lower and upper halves commonly meet at a more or less steep angle. A wide variety of such compound forms is possible, characterised by having a part of the lens formed according to the description given in this specification.

What I claim is:—

1. A multifocal lens having its positive power increasing gradually from top to bottom in the vertical meridianal plane, each surface having for each point on both of its surfaces, the horizontal curvature greater than the vertical curvature, and not more than one of the surfaces being conical.

2. A spectacle lens as claimed in Claim 1, in which the arithmetic mean of the radii of horizontal curvature of the two surfaces, near the centre of the lens, are approximately equal to the distance between this point and the eye-centre.

3. A lens as claimed in either of the preceding claims, having the horizontal curvatures of both surfaces increasing positively from top to bottom in the vertical meridianal plane.

4. A lens as claimed in any of the preceding claims, having its thickness increasing from top to bottom in the vertical meridianal plane.

5. A multifocal lens as claimed in Claim 1, wherein each surface is a surface of revolution having its axis of revolution lying in the said vertical meridianal plane.

6. A lens as claimed in Claim 5, wherein each axis of revolution is inclined obliquely to the horizontal at an angle between 40° and 90°.

7. A lens as claimed in Claim 5 or Claims 5 and 2, having each axis of revolution determined in the following way: draw a line perpendicular to the rear surface through the eye-centre and through both lens surfaces; to the points of intersection with the lens surfaces assign approximate horizontal and vertical curvatures and the approximate relative vertical inclinations and vertical forms of the two lens surfaces and draw the approximate vertical meridianal section of the lens; on the perpendicular to the rear surface mark the virtual eye-centre with respect to the horizontal curvature of the rear surface; mark the centre of horizontal curvature of the front surface on a perpendicular to the front surface at the said point of intersection with the front surface: on the perpendicular to the front surface mark a point distant from the centre of horizontal curvature equal to LAN/BM, through this point and the virtual eye-centre with respect to the rear surface draw an arc with curvature AL/M to cut the two lines representing the vertical meridianal section of the lens at the poles of the required surfaces of revolution

and the axis of revolution pass through the respective centres of horizontal curvature, the symbols having the meanings assigned to them in the foregoing specification.

8. A modification of the lens claimed in Claim 5, wherein to one surface there has been added curvature for the correction of astigmatic errors.

9. A lens as claimed in Claim 5, having one surface conical.

10. A multifocal lens substantially as described herein with reference to the drawings accompanying the provisional specification and the accompanying drawing.

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PROVISIONAL SPECIFICATION

Improvements in or relating to Spectacle Lenses

I, JOHN HENRY JEFFREE, of Woodcot, Woodside Road, Cobham, Surrey, a British Subject, do hereby declare this invention to be described in the following statement:—

Spectacle lenses for the relief of presbyopia can, as is known, be made with a gradually increasing positive power from the top or middle of the lens towards the bottom. To do this the curvature of one of the surfaces in an approximately meridianal section and its curvatures in successive horizontal sections are made of suitably changing amounts. For the sake of simplicity in what follows the direction of increasing positive power in the lenses discussed will be assumed to be downwards along a vertical meridianal section of the lens, as worn, by a plane passing through the effective centre of rotation of the eyeball and lying in the forward—backwards direction; the curvatures and the forms of the lens surfaces and the refractive powers of the lens, in this section, will be called vertical curvatures, vertical forms and vertical powers respectively. Correspondingly, the terms horizontal curvature, horizontal form and horizontal power will signify curvature, form and power in planes of section perpendicular to the aforesaid vertical plane and approximately horizontal unless otherwise specified; and such horizontal curvatures, forms or powers will be those near the vertical meridian unless it is stated otherwise. Naturally the use of these simplifying assumptions in the description is not intended to limit the invention to cases where the lenses are worn only in this manner.

Accordingly, in the known lenses previously referred to, the vertical curvature of one of the surfaces increases in convexity, or decreases in concavity, towards the bottom of the lens, and this surface is therefore of non-spherical form since its vertical form is non-circular. Its horizontal curvatures in successively lower sections show a corresponding increase or decrease, but the horizontal forms, at least near the meridian, may well be circular.

If the changes in horizontal and vertical curvatures down the lens are of the same magnitude, there can result a lens with no unwanted astigmatism along the meridian, but such a lens proves to have increasingly severe oblique astigmatic errors at increasing distances from the meridian laterally. On the other hand it is possible, by making the changes in horizontal curvatures less than that of vertical curvature to an appropriate degree, to produce lenses with no unwanted astigmatism of the type that increases with lateral distance from the meridian, but instead, with unwanted astigmatism dependent on height from the bottom of the lens and therefore present over substantially all the area of the non-spherical surface. A variety of compromises between these two typical cases is also possible but the two types of defect cannot in general be removed simultaneously when only one non-spherical surface is used. This is because the condition for absence of any such errors is, to a first approximation, that the curvature of the non-spherical surface, while varying from point to point, shall be the same, for all directions of section, at any single point; a requirement which can, at most, be met along certain lines on a surface but not over its area generally.

The present invention concerns lenses wherein a gradual increase of power towards the bottom, or in any direction, is obtained by the use of non-spherical surfaces on both sides of the lens. Thereby such errors as have been outlined above can be avoided. The vertical curvatures and forms of the lens surfaces in this invention are chosen, within limits set by convenience and experience, to give the desired power, and the desired downward gradation thereof, to the lens; they may conveniently be slight curvatures, preferably concave towards the eye, or even, for one surface of the lens, zero curvature, that is a straight line, and it is only necessary for one of the surfaces to depart from a straight or circular vertical form. As will be explained below, these vertical curvatures and forms frequently need to be chosen, in the course of design of the lens, by processes of gradual approach to a satisfactory final design, such as are familiar in optical work; but nevertheless there are a variety of choices in any particular case. The horizontal curvatures, however, are comparatively strong for both surfaces, with the curves concave towards the eye, and are preferably such, near the middle of the lens, that the arithmetic mean of the two radii of horizontal curvature is of the same order as the distance from this mid-point to the centre of rotation of the eyeball, that is, of the order of three centimetres. Near this mid-point, moreover, the lens surfaces are preferably so inclined to each other that the lens thickness increases downwards, the amount of inclination being conveniently about the maximum that is possible without introducing objectionable defects of prismatic colour into the field of view. Further, the horizontal curvatures of both surfaces commonly increase towards the bottom of the lens, so that near the bottom their radii of horizontal curvature may be of the order of one to two centimetres.

The simplest lenses according to this invention are those wherein both surfaces are surfaces of revolution. In general, since corrections for visual astigmatism have to be incorporated, the surfaces are conveniently those that are derived from surfaces of revolution by the addition thereto, as specified below, of suitable amounts of astigmatic correction. By such addition of astigmatic correction to a surface is meant, that from a given surface another surface is derived by the process of drawing a line perpendicular to the given surface at some point, and then increasing or decreasing the height of every other point of the surface, in the direction of the said perpendicular line, by amounts approximately proportional to the square of the distance of each said other point from a chosen plane containing that perpendicular line.

The surfaces of revolution from which such actual lens surfaces can conveniently be derived are preferably such that their axes lie in a common plane which is that of a vertical meridianal section as previously defined and which therefore contains the effective centre of rotation of the eyeball, hereinafter called the eye centre. A method of designing such lenses according to this invention will now be explained by reference to the figures in the accompanying drawing, in which Figure 1 illustrates the preferred location of the said axes within a vertical meridianal section and Figure 2 illustrates a number of horizontal sections through a lens according to the invention.

Referring to Figure 1, the eye centre is shown at 11 and the rear surface of the lens at 12. The vertical form and curvature of this surface being approximately or provisionally chosen, a perpendicular is drawn to it, 13, from the eye centre, meeting the surface at 14. The horizontal curvature of the surface at this point being provisionally determined, arbitrarily or from experience, its centre of horizontal curvature is located at point 15 on the line 13. From the refractive index of the lens material and the said horizontal curvature the position of the virtual image of the eye centre as formed within the material by rays refracted at the surface in a horizontal plane through line 13 and rear point 14 is determined by known optical theory as point 16; this point is hereinafter called the virtual eye centre. The perpendicular line 13 being produced to cut the front surface 17 of the lens at point 18, the horizontal curvature of the front surface at this point is determined to give the desired horizontal power to the lens there, and a suitable inclination of the front to the rear surface at this point is also determined arbitrarily or from experience. A perpendicular 19 is drawn to the front surface at this point, and the position on it of the centre of horizontal curvature of the surface is located at 20.

An approximate vertical form and curvature is also chosen for the front surface, arbitrarily, or from experience, being so related to that of the rear surface as to give approximately the desired vertical power and gradation thereof to the lens. There are then determined the following quantities algebraically, that is to say, in any convenient units with any consistent sign convention so that distances measured from centres of curvature forwards or backwards are of opposite signs, and similarly curvatures which are convex forwards or backwards:—

The mean vertical curvature of the rear surface - - - - - - = A
The mean vertical curvature of the front surface - - - - = B
The distance from the centre of rear horizontal curvature, 15 to the virtual eye centre, 16 - - - - = L
The radius of horizontal curvature, rear surface - - - - - - = M
The radius of horizontal curvature, front surface - - - - - - = N

There is then located on the perpendicular 19 to the front surface, a point 21 at a distance from the centre 20 thereon equal to $L \times AN/BM$ and through this point and the virtual eye centre 16 there is drawn an arc 22 with curvature equal to $A \times L/F$ which arc is produced to cut the rear and front surfaces at points 23, 24 respectively. These points may then be taken as the poles of the desired surfaces of revolution at the rear and front respectively; but if the chosen vertical forms are far from circular it is preferable to take as the said poles, the intersections of the arc 22 at points 25, 26 respectively with fictitious rear and front surfaces 27, 28 which have circular vertical forms with curvatures equal to the mean values A, B, respectively and are tangent to the actual surfaces near the middle of the lens as used.

In either case the said poles, with the centres of horizontal curvature 15, 20 and the vertical forms chosen, determine the surfaces of revolution, and the performance of a lens so formed for any pencils of light passing through th eye centre can then be calculated. It is in general only necessary to do this for pencils in the vertical section so far considered, and thereby to discover how nearly the vertical and horizontal powers at various points agree with what is desired. Appropriate alterations are then made to the design parameters and the process repeated till the desired result is achieved. The location of axes in the manner that has been described suffices to ensure that, to a first approximation, the performance found for the meridianal section will also be maintained outside it.

In the above design process reference has been made to the mean vertical curvatures of the lens surfaces. It is not necessary to define this mean value more precisely, since the use of such a mean value at all implies a slight lack of precision in the design process. But in general this lack of precision is not of great practical importance if a mean value of vertical curvature is taken to lie near the mid-point of the extreme values for the parts of the surface used, and if the vertical forms are chosen to be as nearly circular as possible. Obviously, if the vertical forms of both surfaces can be circular this lack of precision does not arise, but that is not usually practicable.

There are, however, two special cases where the above lack of precision is also avoided, namely, those where either the front or the rear surface is conical, so that its vertical curvature is zero. Where this is true of the rear surface, it can be seen from the foregoing formulæ that the distance between the points 20 and 21, being proportional to this curvature, must be zero; that is, the arc 22 passes through the centre of horizontal curvature of the front surface; and its curvature is also zero, being proportional also to the rear surface vertical curvature. Where it is the front surface that is conical, the distance L between points 15 and 16 must be zero to avoid making the distance between points 20 and 21 infinite; that is, the arc 22 then passes through the centre of rear horizontal curvature; and its curvature is again zero, being proportional to the distance L. In either of these cases the virtual eye centre lies on the axis of that surface whose vertical curvature is not zero, and the exact value of its vertical curavture is of no importance for the location of the axes. These special cases therefore represent basic forms providing added freedom of design and convenient for practical application in many instances.

The lines 29, 30, 31 in Figure 1 indicate planes of horizontal section of a lens designed as above described, and the corresponding sections of such a lens are illustrated in Figure 2 at 32, 33, 34 respectively. A lens so designed may be used without further modification when no corrections for visual astigmatism are required to be incorporated; as previously explained, when such corrections are required they are added to one or other surface of such a lens.

It can happen in cases where large corrections for astigmatism have to be incorporated, that the lens form resulting from addition of such corrections proves subsequently capable of improvement in performance by modifications amounting to slight departures from the form determined according to the above directions. This arises from the presence, as in all optical apparatus, of aberrations of higher order than those taken into account in the basic design process, and the correction of such higher order aberrations, which is usual in all optical design, by slight departures from the form determined by basic considerations naturally does not constitute a departure from the invention here described

Lenses according to this invention are conveniently made by molding in transparent plastic materials, and may also be made by grinding and machining processes of known type, in glass, plastics or other materials. Dies for moulding such lenses can, when no astigmatic corrections have to be added to the surfaces of revolution required for the simplest forms, be readily made by known methods of machining and grinding. Where astigmatic corrections have to be added it is often more convenient to make a model of a suitable surface of revolution in plastic or other material, and lay over this a cylindrical lens made in a flexiable material such as moist gelatine, with a suitable adhesive if necessary to cement it to the model surface. The process of adding an astigmatic correction is thus effected mechanically, and from the resulting corrected surface a metal die may then be made by known electroforming or similar processes.

In certain cases lenses incorporating astigmatic corrections can be made according to this invention with the same surface of revolution, and, if moulded, from the same dies, as are appropriate for lenses with no astigmatic corrections, by slight displacements of one die or surface relative to the other. For instance, if one of the surfaces be displaced relative to the other along the direction of a vertical meridianal section, a degree of astigmatism with vertical or horizontal axes is introduced, which can, if suitable vertical forms be chosen for the surfaces, be constant to a first approximation over the whole lens. Again, if one of the surfaces be rotated relative to the other in a plane tangential to its central region, astigmatism about axes inclined at 45 degrees to the vertical is introduced. A considerable range of corrections can be made by combinations of such displacements in varying degrees.

This invention also provides lenses in which a part of the whole lens, say the upper half or more, has surfaces formed and arranged as has been described, and this part is joined or contiguous with another having other forms and arrangements of surfaces, for instance of conventional kind. Such a composite lens can have power increasing gradually down the upper half, and then becoming markedly greater in the lower half. It can also be so arranged that there is no discontinuity in apparent field of view as the line of sight passes from one half to the other. For instance, if the surfaces of the upper half approximate to surfaces of revolution, the surfaces of the lower half may approximate to spheres with centres on the same respective axes, front and rear, as those surfaces, and it is then often possible, with suitable choice of forms for the upper half and of power for the lower half, to arrange that there is no discontinuity in apparent field of view. Or again, to correct such discontinuity approximately, the centre of one or both of the approximately spherical surfaces of the lower half may be displaced forwards or backwards from the appropriate axis of the upper half by a suitable amount. In such compound forms the surfaces of the lower and upper halves commonly meet at a more or less steep angle. A wide variety of such compound forms is possible, characterised by having a part of the lens formed according to the descriptions given in this specification.

Dated this 21st day of September, 1953.
JOHN HENRY JEFFREE.

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775,007 **PROVISIONAL SPECIFICATION**

1 SHEET *This drawing is a reproduction of the Original on a reduced scale.*

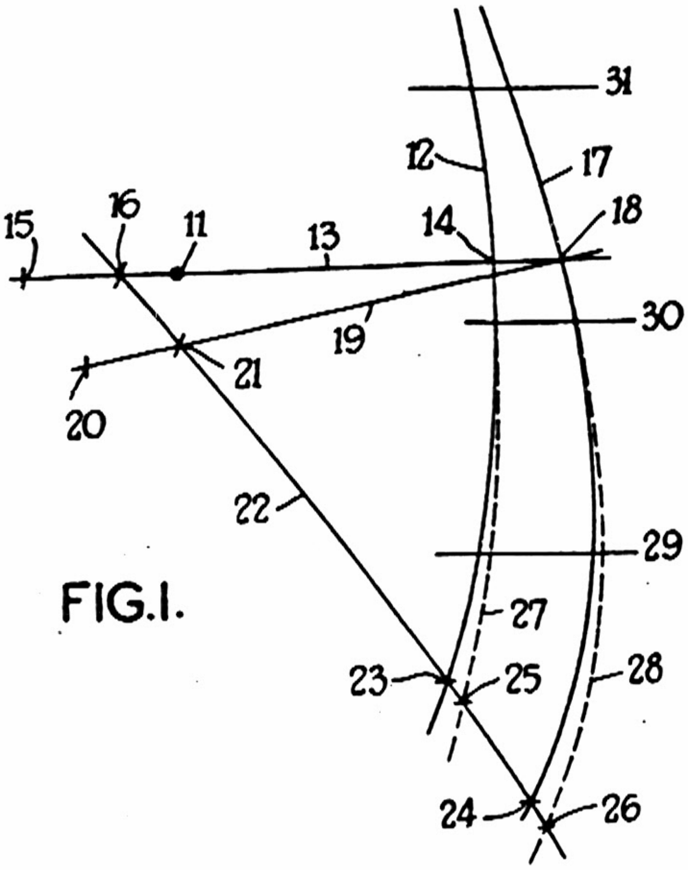


FIG.1.

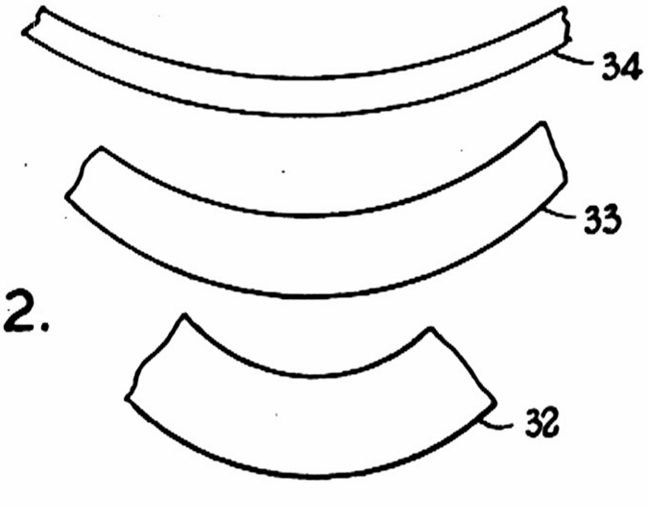
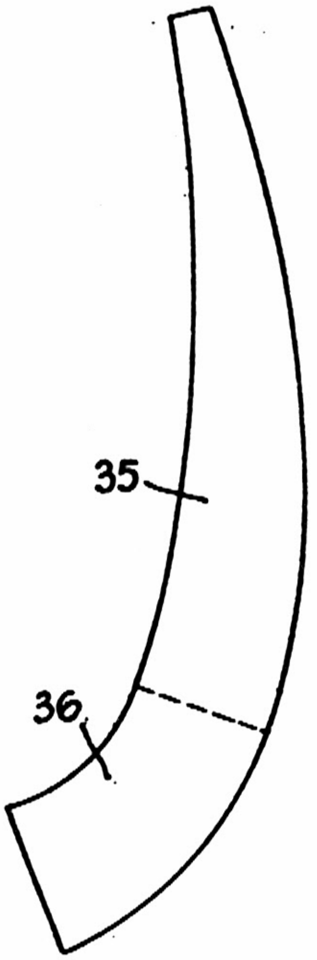


FIG.2.

775,007 **COMPLETE SPECIFICATION**

1 SHEET *This drawing is a reproduction of the Original on a reduced scale.*

FIG. 3.



Poullain, et al., Patent No. 1,143,316.

(See opposite ☞)

UNITED STATES PATENT OFFICE.

AUGUSTIN GEORGES POULLAIN AND DARIUS HENRI JULIEN CORNET, OF PARIS, FRANCE.

OPTICAL LENS.

1,143,316. Specification of Letters Patent. Patented June 15, 1915.

Application filed July 18, 1911. Serial No. 639,091.

To all whom it may concern:

Be it known that we, AUGUSTIN GEORGES POULLAIN, of 44 Rue de Eurbigo, landlord, and DARIUS HENRI JULIEN CORNET, of 66 Rue de Rennes, optician, both in the city of Paris, Republic of France, have invented Improvements in and Relating to Optical Lenses, of which the following is a full, clear, and exact description.

The lenses employed in optics to enable long-sighted, very long-sighted or short-sighted people and also those who have been operated on for cataract to see far and near and known by the names of Franklin lenses, double focus lenses, whether in a single piece or assembled, present the inconvenience that they only give distinct vision for given distances corresponding to the focal lengths of the upper part and the lower part of the lens but not giving distinct images to the eye for intermediate distances. Furthermore there is a line of demarcation between the two portions of the lens which is liable to produce diplopia and the eye is subjected to a certain amount of strain when it looks over this line.

The present invention has for its object a form of lens remedying these defects and allowing by its special constitution to see not only near and far but also at intermediate distances.

This lens is essentially characterized by this fact that it presents on one of its faces, or on both, surfaces with radii of variable curvature uniformly progressive; these surfaces can be combined with surfaces of the same kind or with other surfaces of constant radii of curvature, they can also be joined with each other or with surfaces of constant radii of curvature.

The accompanying drawings show, by way of example, the present form of lens and means for the practical realization of its surfaces with progressive radii of curvature.

Figure 1 shows a spiral with radii of curvature varying in a continuous manner, this spiral showing at a greater scale the main section of one of the faces of the present form of lens; Fig. 2 shows the main section of a lens made according to the present invention; Fig. 3 is a section made according to line b—b' of Fig. 2. Figs. 4 to 18 illustrate modifications in the manufacture of the present form of lens.

This form of lens is based, as mentioned above, upon the employment of surfaces with radii of variable curvature uniformly progressive in a continuous manner either as regards one or both the faces of the lens. Considering such a lens arranged before the eye and sectioned by a plane perpendicular to the line of the eyes (that is to say the plane of the picture in Fig. 1) and passing through the center of the pupil, this section will be designated the principal section. One at least of the faces of the lens will give as intersection with this plane instead of a circular curve or a succession of circular curves limited in number as in the single, double or triple focus lenses referred to above, a curve with variable radii of curvature uniformly progressive in a continuous manner such as a spiral $a\ b\ c\ d$—for example the radii of curvature $a\ a^1$ $b\ b^1$ $c\ c^1$ $d\ d^1$ of which vary in a continuous manner.

If we consider a second section of the lens on a plane passing through a section $c\ c^1$ normal to this curve at any of its points c and perpendicular to the plane of the principal section the same face of the lens will give as intersection with this plane, either a circular curve of radius equal or unequal to the radius of curvature of the principal section at this point or even a straight line (this is the case of cylinders, the generating lines of which are perpendicular to the principal section). The second face of the lens will be a surface of the same kind as the first or a sphere, a plane, a cylinder, a torus.

Example: Given the problem of correcting a slight requiring N_e diopters for seeing at a distance and N_p diopters for near vision without correction of astigmatism.

The principal section of the first face A^1 (Fig. 2) of the lens will be a curve with variable radii of curvature uniformly progressive in a continuous manner and determined in accordance with the index of refraction of the material employed in such a manner that they give a refringence of n_e diopters in the upper part of the lens and n_p in the lower part. For every section perpendicular to the principal section at any one of its points and passing through the normal $c\ c^1$ to this section at this point (Fig. 3), any desired conditions can be imposed for example, that this second section shall be a portion of a circumference with radius equal to the radius of curvature $b\ b^1$ of the principal section at this point c.

The second face A^2 of the lens may be either a surface of the same kind (Figs. 2 and 4) of n'_o diopters in the upper part of the principal section and n'_p in the lower part n_p, n'_p, n_o, n'_o, N_o N_p being selected in such a manner that the following equations are obtained:

$$n_o+n'_o=N_o$$
$$n_p+n'_p=N_p$$

or a sphere of n'_o diopters (Figs. 5 and 6) with the conditions:

$$n_o+n'_o=N_o$$
$$n_p+n'_o=N_p$$

In this manner lenses analogous to ordinary biconvex and biconcave lenses are obtained.

The second surface may also be a surface of the same type as the first and of extreme radii of curvature corresponding to $-n'_o$ and $-n'_p$ (Figs. 7 and 8) with the conditions:

$$n_o-n'_o=N_o$$
$$n_p-n'_p=N_p$$

or a sphere of the curvature of $-n'_o$ diopters (Figs. 9, 10, 11, 12) with the conditions:

$$n_o-n'_o=N_o$$
$$n_p-n'_o=N_p$$

and in this manner lenses analogous to convergent or divergent minisci are obtained.

A plane (Figs. 13, 14) might also be taken as the second surface with the conditions:

$$n_o=N_o$$
$$n_p=N_p$$

which would give lenses analogous to ordinary plano-convex and plano-concave lenses.

In cases where it is at the same time desired to correct astigmatism the second surface may be a cylinder or a torus. The cylinders of the tori may have as their principal section a circumference or a curve with variable radii of curvature which will give lenses analogous to sphero-cylindrical and toric lenses. It is also possible to combine two cylinders or a cylinder and a torus or two tori, one or both of them presenting principal sections of variable radii of curvature by inclining the axes one to the other in order to obtain lenses analogous to those termed Chamblant lenses.

The curvers of uniformly progressive curvature employed for the principal section may be either spirals (archimodian, logarithmic, multiple center, circular evolvent spirals, and so forth), arcs of ellipse, parabola, hyperbola curves of the second degree or of higher degrees, algebraic or transcendent, symmetric or nonsymmetric curves.

The present form of lens can be combined in such a manner that its lowest part enables the person who wears the same to see the ground at its feet without being compelled to lower the head in a very sensible way. In this case, the principal section of this type of lens may be constituted by a curve such that in the downward direction the radius of curvature diminishes to a minimum and then increases progressively, or vice versa. This result may be obtained either by choosing the law of variation of this radius of curvature in such a manner that the increase of this radius is first of all negative and then becomes positive or by taking a curve which is symmetrical relatively to an axes or by taking a non-symmetrical curve and joining it with another curve and proceeding in such a manner that at their point of connection the two curves have the same tangent and the same radius of curvature.

In accordance with special forms of vision the lens will present on one of its faces a surface having as its principal section the system of curve defined above and on the other face either a surface of the same kind or a spherical cylindrical, toric, conical or other surface. The principal section of the lens may also be constituted by two curves each composed of a portion in which the radius of curvature increases or decreases and of a portion in which the radius of curvature remains constant, these two curves being arranged opposite each other in such a manner that the portion with an increasing or decreasing radius of curvature of each of these curves corresponds to the portion with constant radius of curvature of the other curve.

Fig. 15 illustrates a method of obtaining a lens of this kind, intended for a person having undergone an operation for cataract requiring 16 diopters for near vision and 12 diopters for distant vision. In the principal section represented in this figure the front face comprises: (a) An upper half the radius of curvature of which decreases progressively from the upper extremity to the median part, its different points corresponding to 4, 5, 6, 7 and 8 diopters. (b) A lower half the radius of curvature of which is constant and correspond to the value of 8 diopters. The rear face of the lens is constituted by a similar but inverted curve in such a manner that the half of each face with decreasing radius of curvature is opposite the portion with constant radius of curvature of the other face.

Considering the different levels of the

principal section in the downward direction the following results are obtained:

At the upper part:

$$4^d+8^d=12^d$$

Then:

$$5^d+8^d=13^d$$
$$6^d+8^d=14^d$$
$$7^d+8^d=15^d$$

In the median part:

$$8^d+8^d=16^d$$

Then below:

$$8^d+7^d=15^d$$
$$8^d+6^d=14^d$$
$$8^d+5^d=13^d$$

At the lower part:

$$8^d+4^d=12^d$$

Figs. 16 and 17 show two other methods of obtaining the present lens for long-sighted and short-sighted persons; in each of these lenses the central part alone A^3 A^4 is of varying radius of curvature, the upper part A^5 A^3 and lower parts A^4 A^6 are spherical and their radii are respectively equal to the radii of curvature of the extreme points A^3 A^4 of the central part with which these spheres are thus connected without any line of demarcation.

Fig. 18 shows a lens more particularly intended for persons who have been operated on for cataract. This lens comprises:—At its upper part, a surface A^7 A^8 of constant radius allowing to see far,—above the latter a surface A^8 A^9 with variable radii of curvature progressively decreasing, allowing to see at intermediate distances, the part A^9 allowing to see near,—this surface is prolonged with a surface A^9 A^{10} with radii of curvature progressively increasing and enabling to see at intermediate distance toward the ground;—this surface can be prolonged with another surface A^{10} A^{11} of constant radius allowing the person who wears this lens to see at its feet with a sufficient field of view.

Considering the section defined in the lens by a plane perpendicular to the principal section defined above passing through a point of the curve of the latter and by the normal to this curve at this point this section will be a portion of a circumference of a radius equal or unequal to the radius of curvature of the principal section at this point; by giving these two radii suitably selected unequal values the correction of astigmatism can be introduced.

In cases where the two faces of the lens are constituted by fragments of cylinders, the axes of which intersect while the principal sections are curves of the kind indicated above either symmetrical or unsymmetrical astigmatism can be corrected in inclining the axes of the two cylindrical surfaces one to the other not exactly at right angles as in the Chamblant lenses but at an angle which must be determined in accordance with the defect to be corrected.

In order to obtain the surfaces indicated above, the methods ordinarily employed by opticians for cutting spherical, cylindrical or toric lenses would not be suitable and that it would be necessary to have recourse to special machines.

Claims:

1. A spectacle glass with multiple foci, presenting, on one of its faces, a surface determined: on the one hand by a directrix curve situated in the principal section of this glass, in the direction of its height and such that the radii of curvature of its different points vary progressively in a continuous manner,—and on the other hand by generatrix curves cutting this curve and constituted by circumferential arcs situated in planes perpendicular to the principal section of the glass and normal to the said curve.

2. A spectacle glass with multiple foci, presenting on its two faces, a surface determined: on the one hand by a directrix curve situated in the principal section of this glass, in the direction of its height and such that the radii of curvature of its different points vary progressively in a continuous manner,—and on the other hand by generatrix curves cutting this curve and constituted by circumferential arcs situated in planes perpendicular to the principal section of the glass and normal to the said curve.

3. A spectacle glass with multiple foci, presenting on one of its faces a surface determined,—on the one hand by a directrix curve situated in the principal section of this glass in the direction of its height, and composed of parts such that the radii of curvature at the different points of the said parts vary progressively in a continuous manner and of other parts of constant radius of curvature, and on the other hand by generatrix curves cutting the directrix curve and constituted by circumferential arcs, situated in planes perpendicular to the principal section of the glass and normal to the said curve.

4. A spectacle glass with multiple foci, presenting, on one of its faces, a surface determined: on the one hand by a directrix curve situated in the principal section of this glass, in the direction of its height and such that the radii of curvature of its different points vary progressively in a continuous manner,—and on the other hand by generatrix curves cutting this curve and constituted by circumferential arcs situated in planes perpendicular to the principal section of the glass and normal to the said curve, these generatrix curves having radii of curvature respectively equal to the radii

of curvature of the directrix curve at its points of intersection with said generatrix curves.

5. A spectacle glass with multiple foci, presenting on one of its faces, a surface determined: on the one hand by a directrix curve situated in the principal section of this glass, in the direction of its height and such that the radii of curvature of its different points vary progressively in a continuous manner,—and on the other hand by generatrix curves cutting this curve and constituted by circumferential arcs situated in planes perpendicular to the principal section of the glass and normal to the said curve, these generatrix curves having equal radii of curvature.

6. A spectacle glass with multiple foci, presenting, on one of its faces, a surface determined: on the one hand by a directrix curve situated in the principal section of this glass, in the direction of its height and such that the radii of curvature of its different points vary progressively in a continuous manner,—and on the other hand by generatrix curves cutting this curve and constituted by circumferential arcs situated in planes perpendicular to the principal section of the glass and normal to the said curve, these generatrix curves having radii of curvature varying among themselves in a constant manner.

The foregoing specification of our improvements in and relating to optical lenses signed by us this seventh day of July, 1911.

AUGUSTIN GEORGES POULLAIN.
DARIUS HENRI JULIEN CORNET.

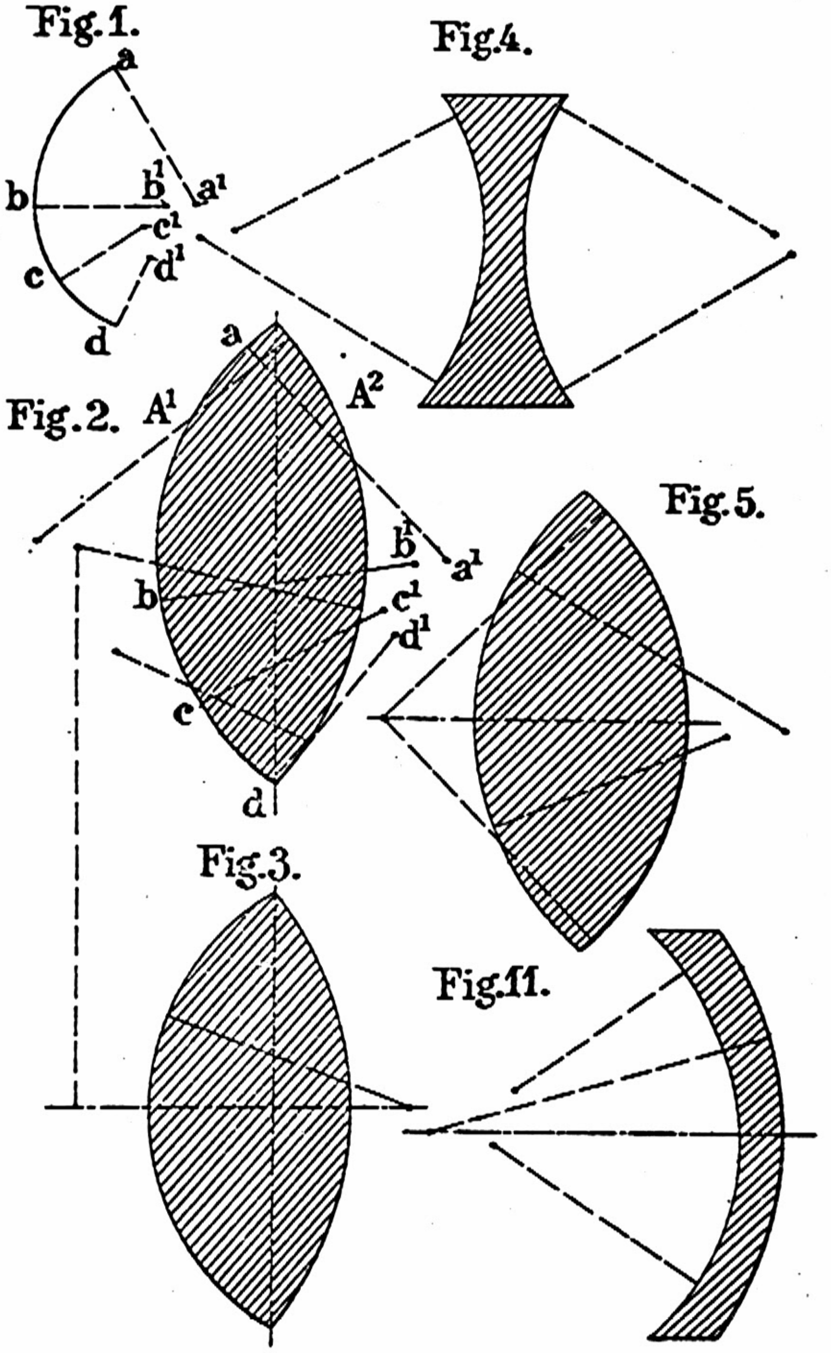
Witnesses:
H. C. CONGE,
R. THIRIOT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

A. G. POULLAIN & D. H. J. CORNET.
OPTICAL LENS.
APPLICATION FILED JULY 18, 1911.

1,143,316. **Patented June 15, 1915.**

3 SHEETS—SHEET 1.



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ATTY.

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3 SHEETS—SHEET 2.

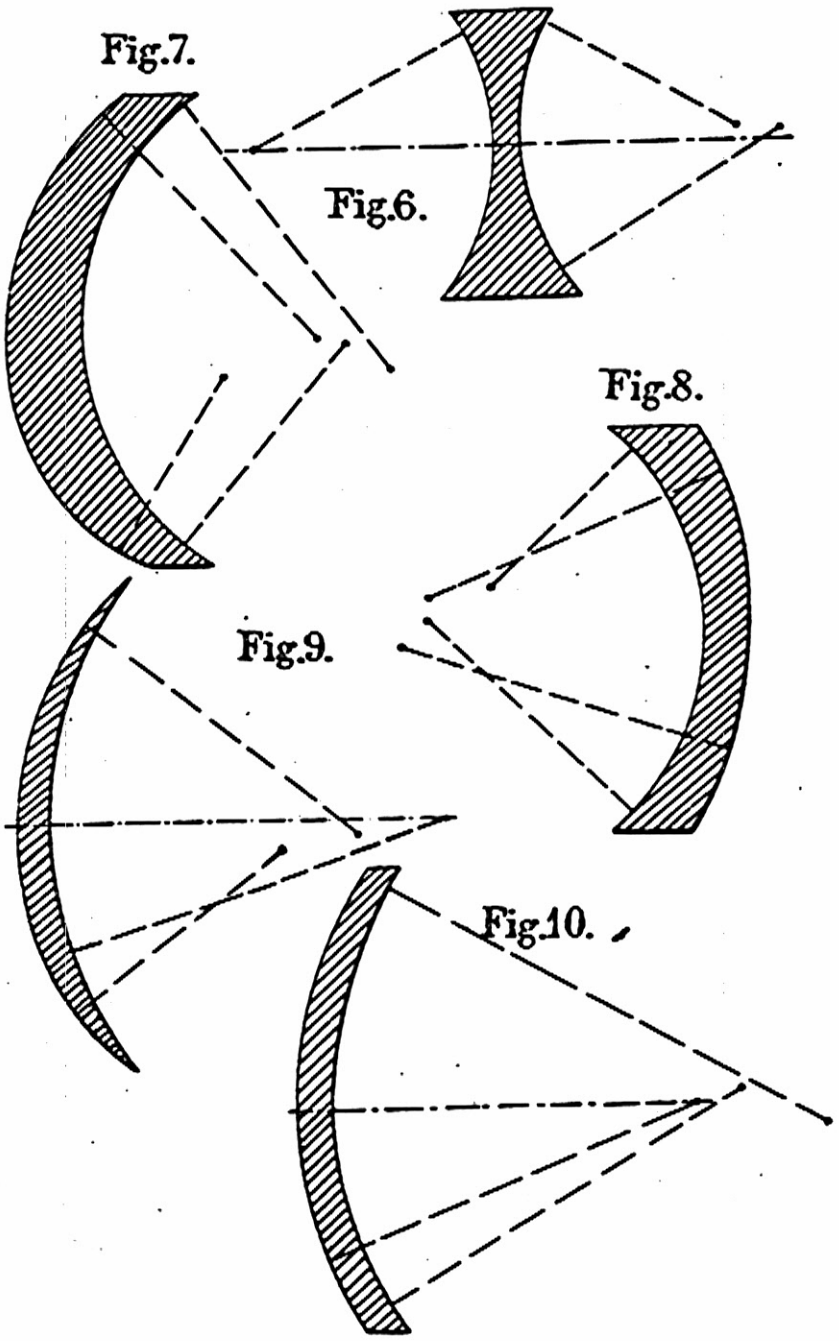

Fig.7.

Fig.6.

Fig.8.

Fig.9.

Fig.10.

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BY Wm. Wallace White ATT'Y

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A. G. POULLAIN & D. H. J. CORNET.

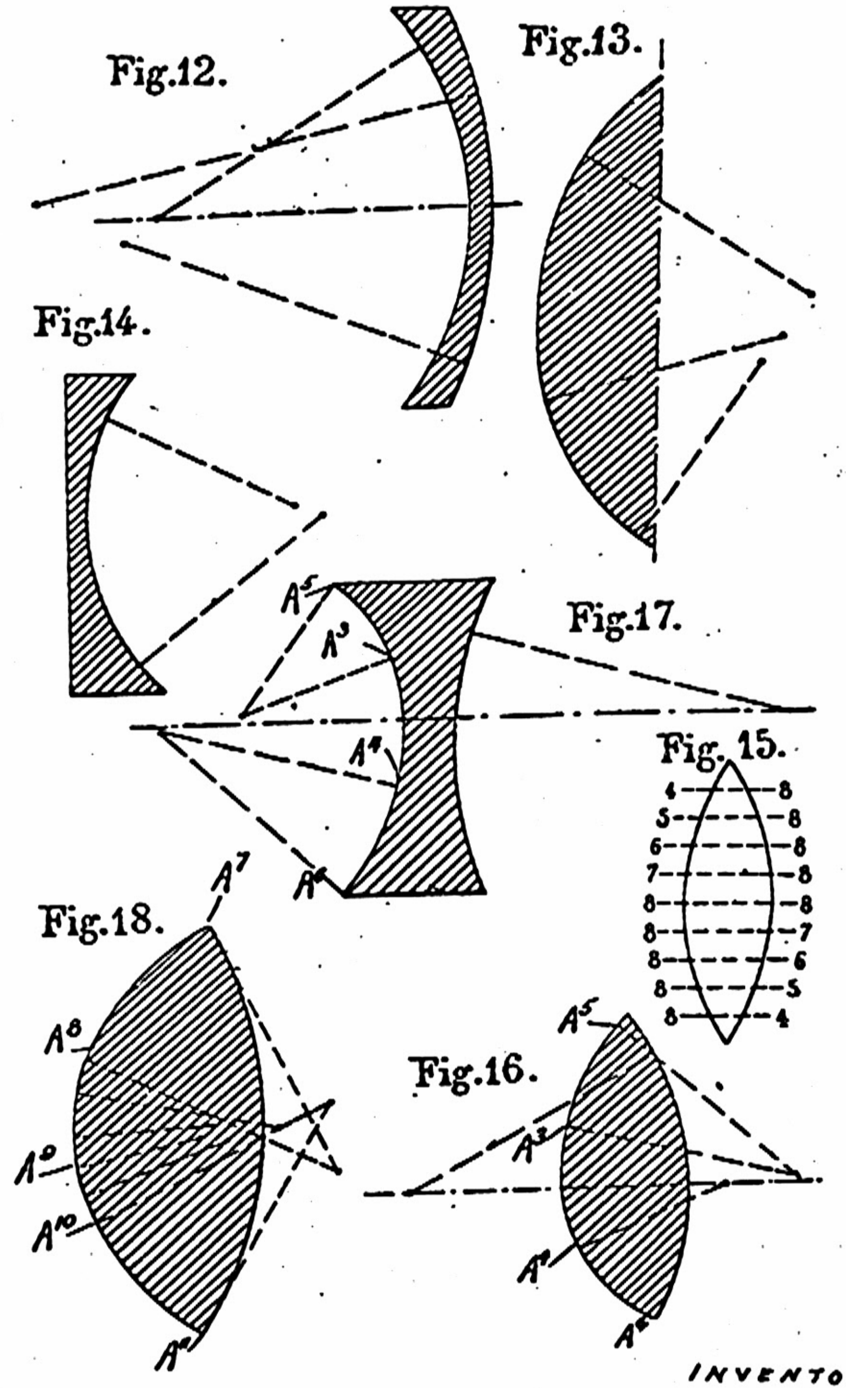
OPTICAL LENS.

APPLICATION FILED JULY 18, 1911.

1,143,316.

Patented June 15, 1915.

3 SHEETS—SHEET 3.



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BY

ATTY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

March 1, 1938. C. E. EVANS 2,109,474

SPECTACLE LENS

Original Filed Dec. 7, 1931

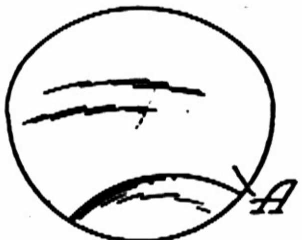

Fig.1. (Prior Art)

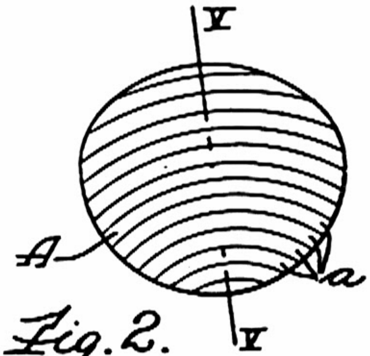

Fig.2.

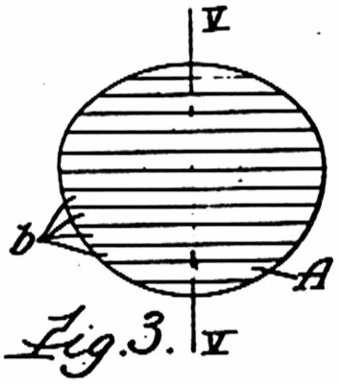

Fig.3.

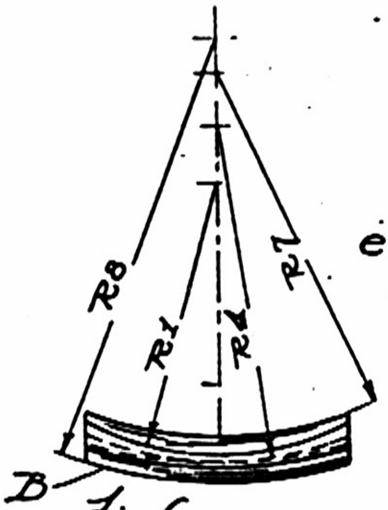

Fig.6.

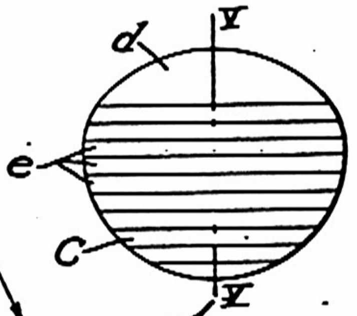

Fig.7.

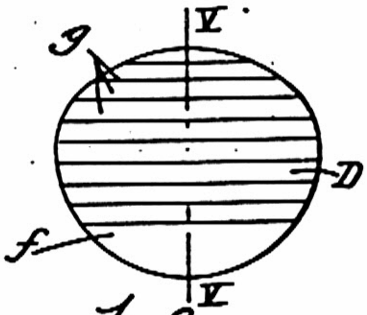

Fig.8.

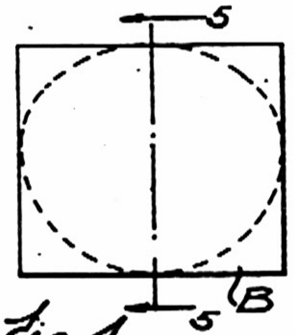

Fig.4.

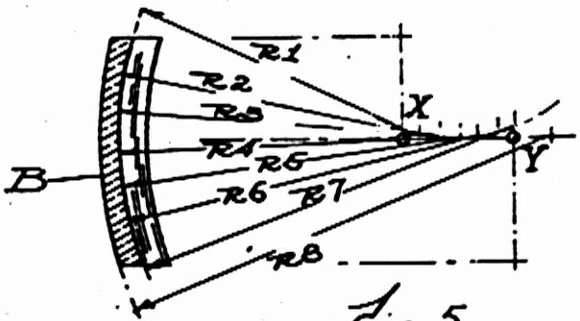

Fig.5.

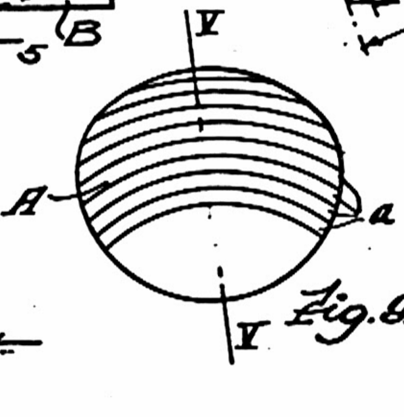

Fig.9.

INVENTOR.

Charles E. Evans.

BY Burton & Burton

his ATTORNEYS.

Witness.
H.C. McKnight

Patented Mar. 1, 1938 **2,109,474**

UNITED STATES PATENT OFFICE

2,109,474

SPECTACLE LENS

Charles Ernest Evans, Aurora, Ill.

Application December 7, 1931, Serial No. 579,451
Renewed May 28, 1937

14 Claims. (Cl. 88—54)

My invention relates primarily to a lens, the dioptric power of which varies gradually from one edge to the opposite edge with certain allowable modifications as hereinafter set forth.

In the following statements, it is assumed that the lens varies in dioptric power from top to bottom with the near vision at the bottom. However, it is obvious that such a lens could be rotated any amount to suit special conditions, up to 180 degrees, as might be required by the operator of an overhead crane.

The primary objects of my invention are:

To produce an improved lens which will give the user selective focal lengths to suit various conditions;

To provide a lens that practically entirely eliminates all blurring, aberration and prismatic effects such as are ordinarily present in lenses having the usual multi-focal grindings;

To produce a lens which will give uninterrupted vision over its entire surface and which has no visible indication of the multi-focal effect and which also can be ground from one piece of glass of a uniform index of refraction without a multiplicity of operations;

To provide a lens having focal lengths arranged in a sequence to be most convenient to the user's natural use of same while working at a table, desk or bench or on a machine, or playing various games, such as tennis, ball, cards, etc.;

And also to provide a lens of this character which can be carried in stock sizes with one face ground and leaving the other face to be ground with any of the usual or special grindings which may be necessary to correct various defects of the eye or to improve the vision.

To acquaint those skilled in the art with the manner of constructing and practicing the present invention, I shall now describe certain embodiments of the same in connection with the accompanying drawing in which:

Figure 1 shows a lens with the usual bifocal grindings with a more or less clearly defined line between the areas of different dioptric power.

Figures 2 and 3 indicate two forms in which a lens embodying my invention may be ground.

Figure 4 shows for purpose of illustration a face view of a rectangular blank whose over-all dimensions are such as to permit forming of the various conventional shapes of lenses.

Figure 5 is a vertical section taken at line, 5—5, on Figure 4, showing diagrammatically the method of generating the surface of a lens embodying my invention.

Figure 6 is a plan view of the lens also showing diagrammatically the method of generating the lens surface.

Figures 7, 8 and 9 are diagrammatic representations of other forms of lenses which may be produced in accordance with the present invention.

This graduated grinding may be imposed on the convex or concave or both sides of the lens as best suits various cases, and for purpose of illustration I have shown a graduated grinding formed on the concave surface of the lens.

One way in which the graduated surface of such a lens could be generated would be by a line of the same curvature as a vertical element of said surface, the location of such vertical element being indicated by the line V—V on Figures 2, 3, 7, 8 and 9. Each end of this curved line may be constrained to move in an approximately horizontal plane, so that the points of said line will describe horizontal lines across the lens surface as seen in Figure 3; or the ends of the generating line may be constrained to move in concentrically curved paths so that all points in the line will describe concentric curves on the lens surface, as seen in Figure 2. In either case the opposite ends of this generating curved line will swing across the lens surface on different radii centered in two fixed points respectively, the position of the points and the length of the two radii being chosen so as to produce the desired surface. This lens could be ground by means of a lap or grinding block whose surface had been formed to the reverse shape of the surface required for the lens; this lap or grinding block being given a double reciprocating motion with respect to the lens while in contact with the same. Such a lens can also be ground on machines especially constructed for the purpose.

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Book

It is not required that such a lens have an axis of generation; therefore the loci of the surface can be located without regard to such an axis, and as best suited to other conditions. Therefore, also points of equal focal lengths can be on practically horizontal lines, or on lines of a desirable curvature, without reference to such an axis of generation. However, it is obvious that a lens of limited characteristics could be generated about one axis of generation, the dioptric power of which lens would vary gradually from one edge to the opposite edge.

If any transverse segment indicated at *a*, or *b*, of the lens, A, shown in Figures 2 and 3 respectively, were ground as a lens whose strength was midway between that of its two adjacent segments, and these segments were made infinitely narrow! we would have a lens that varied in dioptric power gradually from one edge to the other. For purpose of illustration we may assume that the original shape of the lens blank is rectangular in outline, as indicated at B, and is of proper size for producing the conventional shapes.

Referring now to Figures 4 and 5 of the drawing, it will be seen that the lens blank, B, has a convex exterior surface ground to a single radius of curvature indicated at R^8, and a concave inner surface ground to varying radii, R^1, R^2, R^3, R^4, R^5, R^6 and R^7. It will be manifest that an infinite number of radii of desired lengths may be employed for forming this graduated concave surface of the lens so as to produce an uninterrupted, smooth surface of gradually varying dioptric power. By way of illustration I have shown in Figure 6 of the drawing the true lengths of radii indicated as R^1, R^4, R^7 and R^8, etc., as equal to the radii, R^2, R^4, R^7 and R^8 in Figure 5 of the drawing. It will be apparent that when actually measured on the drawing, these radii, R^1, R^4, R^7 and R^8, in Figure 6 are equal to the projected lengths of the radii, R^1, R^4, R^7 and R^8, in Figure 5 of the drawing. However, it is manifest that the vertical curvature of the inner or concave surface of the lens formed by the radii, as seen in Figure 5, might be an involute or other suitable curve. Therefore, it is to be understood that the drawing is merely for purpose of illustration and is only approximately correct. For instance, it might be advisable not to make the true lengths of radii R^1 to R^7 in Figure 6 exactly equal to radii R^1 to R^7 in Figure 5, but to modify them so as to obtain the best optical effect. As may be seen in the drawing, the loci of the radii, R^1, R^2, R^3, R^4, R^5, R^6, and R^7, are shown located on a curved line, and it will be manifest that if said radii are of such length as to produce a surface of the lens that would be a true involute curve, then such loci of said radii would be located on an arc of a circle. In any event, the inner surface of the lens may be conceived as generated by swinging this curved line transversely of the lens so that its upper end swings on a radius substantially equal to R^1, and its lower end swings on a radius substantially equal to R^7, these radii being centered in fixed points indicated respectively at X and Y on Figure 5. The lap or other grinding element for producing the surface of varying curvature may be swung upon suitable carrying arms whose shape and position are merely indicated by broken lines extending angularly from the points X and Y toward the lens in Figure 5.

This graduated focal grinding may be ground so that it will merge at either or both edges with spherical grindings for distance and, or, reading vision, providing areas of constant dioptric powers, so that the eye may be shifted from registration with one portion of the lens to another without producing any abruptness or unevenness of vision. For purpose of illustration the lens, C, shown in Figure 7 of the drawing is formed with an upper portion, *d*, of constant dioptric power ground for distant vision, and a lower portion, *e*, formed with a graduated focal grinding to provide an area of gradually changing dioptric power which blends and merges at its upper edge into the constant dioptric power area, *d*. In Figure 8 the lens, D, is shown formed with the lower portion, F, of constant dioptric power ground for close or reading vision and the upper edge of said area merges and blends into the area, G, of constantly varying dioptric power. By virtue of the construction shown in Figures 7 and 8, the eye may be shifted to selectively register for vision through any desired focal region of the areas, *e* or *g*, of gradually varying dioptric powers, so that objects in the near distance range may be seen clearly and distinctly, and when the eye is caused to be shifted from the areas, *e* or *g*, for registration with the areas of constant dioptric power indicated as *d* and *f*, the change will be practically unnoticeable by the eye, since there will be no aberration or prismatic effect because the portions of the graduated focal areas, *e* and *g* immediately adjacent these constant dioptric power areas gradually blend so that at the line at which these areas merge, the dioptric power is the same. It will be manifest that such a lens will not have any interruption of its entire surface and completely insures against double or distorted images which are characteristic of the usual bifocal lenses. If required, this graduated focal grinding can have a different dioptric power horizontally than vertically at the same point in order to correct astigmatism, etc. When both sides of the lens are ground with a graduated surface the dioptric curvature of each surface as measured on a horizontal axis, may be different from that measured on a vertical axis and still the dioptric power of the lens may be constant in all directions at one point.

As is well understood in the art, the vertical or horizontal meridians of the lens may be located several degrees one way or the other from the 90 degree or 180 degree bases of the lens. Therefore, wherever reference is made in the specification and claims to vertical or horizontal measurement of the lens power, or dioptric curvatures of the lens surface, it is to be understood that such measurements are taken along the principal meridians of the lens.

It will be manifest that for commercial purposes a lens of this character can be carried in stock sizes with one surface provided with a graduated focal grinding and the other surface to be ground with any of the usual or special grindings necessary to obtain a lens of desired specifications to correct certain defects of the eye or to improve the vision.

While there is shown and described herein certain specific embodiments of my invention, it will be manifest to those skilled in the art that the invention is capable of further modification without departing from the spirit and scope thereof, and that the same is not to be limited to the particular forms herein shown and described, except in so far as indicated herein by the appended claims.

I claim:

1. An optical element made from one piece of glass of a uniform index of refraction having a ground uninterrupted surface, the dioptric curvature of which increases gradually from one edge to the opposite edge, the curvature of said surface in transverse direction being constant along concentrically curved lines, and the curvature at practically any point along any one of said concentric lines being substantially equal to the vertical curvature at said point.

2. An optical element having a ground uninterrupted surface, the dioptric curvature of which increases gradually from one edge to the opposite edge, said surface being generated by a line of the same curvature as an element of said surface, one end of which line is constrained to move in a curved path tangent to a horizontal plane through said element on a radius about one of

two fixed points, while the other end of said line moves similarly on a radius about the other of said fixed points.

3. An optical element having a ground, uninterrupted, multi-focal surface including an area, the dioptric curvature of which, when measured along the vertical meridian, gradually varies from one edge of said area toward the opposite edge, and the curvature of said surface area, in the direction transverse to said vertical meridian, being generated on concentric lines, so that the dioptric curvature of said area, when measured transversely to the vertical meridian at practically any point along any of said concentric lines, is substantially equal to the vertical curvature at said point.

4. An optical element having a ground uninterrupted surface including an area, the dioptric curvature of which area increases gradually from one edge to the opposite edge of the area, the surface of said area being generated by a line of the same graduated curvature as an element of said surface, the opposite ends of which line are constrained to move about separate fixed points at respectively different radial distances from said points and along curves concentric with each other.

5. An optical element having a ground, uninterrupted surface including an area the dioptric curvature of which gradually varies from one edge toward the other edge where it merges and blends with an area of constant dioptric curvature, said first mentioned area being generated by a line of the same curvature as an element of said surface, the ends of which line are constrained to move in curved paths tangent to horizontal planes through said element on radii about two fixed points, respectively.

6. An optical element made from one piece of glass of a uniform index of refraction having a ground, uninterrupted surface, the dioptric curvature of which increases gradually from one edge to the opposite edge and in which, in a transverse direction, points of equal dioptric curvature lie on a horizontal line parallel to other lines passing through points of other equal dioptric curvature, the dioptric curvature of said surface at practically any one point being substantially the same horizontally as vertically.

7. An optical element having a ground uninterrupted surface, the dioptric curvature of which increases gradually from one edge to the opposite edge, said surface being generated by a line of the same curvature as an element of said surface, the ends of which line are constrained to move in substantially horizontal planes on radii about two fixed points, respectively.

8. An optical element made from one piece of glass of a uniform index of refraction having a ground, uninterrupted surface including an area, the dioptric curvature of which gradually varies from one edge to the opposite edge of said area, and in which area, in a transverse direction, points of equal dioptric curvature lie on a horizontal line which is parallel to other lines passing through points of other equal dioptric curvature, the dioptric curvature at practically any one point being substantially the same horizontally as vertically.

9. An optical element having a ground uninterrupted surface including an area, the dioptric curvature of which gradually varies from one edge toward the other edge where it merges and blends with an area of constant dioptric curvature, said first mentioned area being generated by a line of the same curvature as a vertical element of said surface, the ends of which line are constrained to move in substantially horizontal planes on radii about two fixed points, respectively.

10. A lens including a portion having opposite ground surfaces, the dioptric curvature when measured horizontally at any point on one of said surfaces being different from the vertical curvature at said point, and the dioptric power of said lens portion when measured horizontally at said point being the same as the dioptric power when measured vertically at said point.

11. A lens including a portion having opposite ground surfaces, one of said surfaces being an uninterrupted multifocal surface, the dioptric curvature of which, when measured along the vertical meridian, gradually varies from one edge of said portion toward the other edge, the dioptric curvature when measured horizontally at any point on one of the surfaces of said portion being different from the vertical curvature at said point, and the dioptric power of said lens portion when measured horizontally at said point being the same as the dioptric power when measured vertically at said point.

12. An optical element having a ground, uninterrupted multi-focal surface including an area, the dioptric power of which, when measured along the vertical meridian, gradually varies from one edge toward the opposite edge where it merges and blends with an area of constant dioptric power, and the curvature of said multi-focal surface area in the direction transverse to said vertical meridian being generated on concentrically curved lines, and the dioptric power of said area, when measured transversely to the vertical meridian, being the same at all points along any one of said concentric lines.

13. An optical element having a ground, uninterrupted surface including an area the dioptric curvature of which area increases gradually from one edge toward the opposite edge of the area, the surface of said area being generated by a line of the same graduated curvature as an element of said surface, the opposite ends of which line are constrained to move about separate fixed points at respectively different radial distances from said points and along paths parallel to each other.

14. An optical element having a ground, uninterrupted surface including an area, the dioptric curvature of which, when measured along the vertical meridian, gradually varies from one edge of said area toward the opposite edge, and the curvature of said surface area, in the direction transverse to said vertical meridian, being generated on parallel lines, so that the dioptric curvature of said area, when measured transversely to the vertical meridian at practically any point along any of said parallel lines, is substantially equal to the vertical curvature at said point.

CHARLES ERNEST EVANS.

Decision of the Board of Appeals.

Appeal No. 461-19

Hearing:
March 5, 1963

IN THE UNITED STATES PATENT OFFICE

Before The Board Of Appeals

Ex parte Guy Bach

Application for Patent filed October 2, 1957, Serial No. 687,821. Optical Apparatus.

Bauer and Seymour and Edward W. Grimm for appellant.

Before Dracopoulos and M. F. Bailey, Examiners-in-Chief, and Angel, Acting Examiner-in-Chief.

Angel, Acting Examiner-in-Chief.

This is an appeal from the final rejection of claims 1, 2, 5-10, 12 and 13. Claims 3 and 4 have been held to be withdrawn as not readable on the elected species of Figure 3, in the absence of an allowable generic claim. No claims have been allowed.

Claim 1 is illustrative and reads as follows:

1. A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces

of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface.

The references relied on are:

Poullain	1,143,316	June 15, 1915
Evans	2,109,474	Mar. 1, 1938
Jeffree (France)	1,112,429	Nov. 16, 1955

(Corresponding to Jeffree-British patent No. 775,007, May 15, 1957).

Appellant has given a description of his invention on pages 1 to 4 of the brief. The references are described in the Examiner's Answer.

The claims stand rejected as being based on an insufficient disclosure. In stating his point of view, the Examiner refers to the specification, the drawing and the claims wherein the surface of the lens is said to have no astigmatism (page 3, line 2), at least one region of constant astigmatism (page 4, line 4) and the claimed constant astigmatism (claim 1). He contends the appellant has not adequately established that a multifocal surface as described, will have constant astigmatism. He calls attention to the inconsistency between the tabulation on page 5 of the specification and Figure 4 of the drawing.

Appellant argues that the deviations shown in the last column of page 5 of the specification are extremely small, that this disclosure is of a commercially produced embodiment. It is appellant's opinion that his disclosure is directed to one skilled in the art, an optical worker skilled in the art.

Appellant states that surface 11 is a surface of revolution formed "in a manner to be described" (page 3, line 16). In line 20, it is stated that "the power of the lens in any horizontal line being constant'', not a zone, a region nor an area. The ''manner to be described'' is presumably, the explanation relative to Figures 4, 5 and 6. We share the view presented by appellant at the hearing that the plottings in Figure 4 of the x and y values from the table on page 5 of the specification are reversed and that the curve should be drawn so that the high values of y are near the oy axis and the low values remote therefrom. However, we fail to find an explanation as to how the horizontal lines of Figure 2, each said to have a constant value of astigmatism, can be produced according to Figure 4 by revolving the line C about the axis o-x.

Appellant argues that the statutory requirement of 35 U.S.C. 112

> ''. . . in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains . . .''

is satisfied by addressing only an optical worker in the art. It is our opinion that the Examiner who has the responsibility of recognizing and allowing claims to meritorious inventions is to be considered a person skilled in the art and as such is entitled to a clarification of features which appellant alleges to be patentable. We have carefully considered the arguments in the brief and those presented at the oral hearing and we are constrained to support the Examiner's view that the disclosure does not satisfactorily reveal how appellant produces a lens having front and rear surfaces of revolution, the front being of multifocal area with constant astigmatism, the rear being of component toroidal surfaces, one having astigmatism opposite to the front surface, the other opposite to the astigmatism of that of the eye to be corrected.

The claims stand rejected as being indefinite. The Examiner takes the position that the claims set forth a condition or property of a lens surface without clearly defining in structural terms the specific configuration of the surface. Appellant is of the opinion that he has defined the configurations of the surface in terms which comply with Section 112 of 35 U.S.C.

We find the claims using the same terminology as in the specification. There seems to be involved herein the same uncertainty of understanding of the invention as in the rejection on incomplete disclosure and the same inconsistency of interpretation of the specification by appellant and the Examiner. We are of the opinion that a complete explanation of the invention would clarify this indefinite condition. We will sustain the rejection.

The claims were further rejected as unpatentable over any one of Poullain, Evans or Jeffree. The Examiner's view is that there is no patentable advantage in selecting a constant astigmatism for the multifocal surface then neutralizing this astigmatism and incorporating the required astigmatism in a composite rear toric lens in view of the teachings of the references.

Appellant contends that the "astigmatism" of Jeffree is not the same as that set forth in the appealed claims, that the appealed claims should be given their intended meaning as set forth in the application as a whole. We fail to find a clear definition of appellant's use of the term especially if it is to be interpreted differently than the commonly and well known idea in the art.

He says that the Evans and Poullain references have vague and indefinite disclosures, that they do not show a lens one face of which has a constant astigmatism in at least one region of substantial area. Poullain states at line 34 of page one that one face may have surfaces with radii of variable curvature. He states at line 90 that the second face may be a torus. At line 50 of page 2 he discusses correction of astigmatism by use of a cylindrical or toroidal surface. Jeffree discusses that both faces of the lens are surfaces of revolution, and the incorporation of astigmatic correction when desired.

We have carefully considered the arguments and references and we find it extremely difficult to determine what differences in fact actually exist and consequently if there is any patentable distinction of the claims over the art before us. Under these circumstances we are constrained to sustain the Examiner's rejection of the claims.

The decision of the Examiner is affirmed.

Affirmed

Bauer and Seymour
30 Rockefeller Plaza
New York 20, New York

Decision of the Board of Appeals on Petition for Reconsideration.

Paper No. 24

Appeal No. 461-19

IN THE UNITED STATES PATENT OFFICE

BEFORE THE BOARD OF APPEALS

Ex parte Guy Bach

Application for Patent filed October 2, 1957, Serial No. 687,821. Optical Apparatus.

Bauer and Seymour and Edward W. Grimm for appellant.

Before Dracopoulos and Bailey, Examiners-in-Chief, and Angel, Acting Examiner-in-Chief.

Angel, Acting Examiner-in-Chief.

This is a petition for rehearing and reconsideration of our decision of April 18, 1963, wherein we affirmed the Examiner's rejection of claims 1, 2, 5 to 10, 12 and 13.

By reason of the number of cases confronting this Board, rehearings are granted only in exceptional cases. We do not find any exceptional circumstances in this case such as would justify a rehearing. The request for reconsideration will be confined to the record already before us.

Appellant argues that we misunderstood the scope and meaning of the application in coming to the conclusion that the disclosure is insufficient. Again, as in the brief, he discusses "astigmatism" and "constant astigmatism in at least one region". He contends by referring to the specification, as was done in the brief, that the invention is completely disclosed and can be clearly understood by an expert, as the inventor, if not by such as the Board or the Examiner. He presents as an exhibit a sample of his lens.

The request comprises for the most part a reargument of the brief and a disagreement with our decision. We have carefully considered the argument and have reviewed our decision. The specification, to which the Examiner objected as insufficiently describing appellant's attainment of constant astigmatism, is still the same. We are not convinced of error in our decision. The Examiner was entitled to a complete explanation of those features with which he took issue.

The exhibit is interesting, but being a finished product fails to supply the necessary explanation to the specification as to how to produce such curvatures.

Appellant's request is granted to the extent that we have reconsidered our decision but is denied with respect to making any changes therein.

Bauer and Seymour
30 Rockefeller Plaza
New York 20, New York

Bill of Complaint in Civil Action to Obtain a Patent.

The Plaintiff herein for his Bill of Complaint alleges:

1. The Plaintiff, Compagnie de Saint-Gobain, is a corporation of France, having an address at 62, Boulevard Victor-Hugo, Neuilly-sur-Seine, France, and is the assignee of the entire right, title and interest in and to United States application for Letters Patent Serial No. 687,821, filed October 2, 1957, by Guy Bach for "Optical Apparatus".

2. The Defendant, David L. Ladd, is the Commissioner of Patents of the United States, is a legal resident of the District of Columbia and is sued as Commissioner of Patents of the United States.

3. This is an action under the Patent Laws of the United States, particularly under Sections 145 and 100-120, inclusive, of the Patent Act of 1952, Public Law 593, 82nd Congress, Second Session, Chapt. 950, 66 Stat. 792, Approved July 19, 1952, and under the treaty law pertaining to patents.

4. On October 2, 1957, Plaintiff's assignor, Guy Bach, filed an application for patent in the United States Patent Office for "Optical Apparatus", of which said Bach was the original, first and sole inventor, and said application was assigned Serial No. 687,821.

5. The said application for patent was filed in compliance with the requirements of the laws of the United States in such cases made and provided and in compliance with the Rules of Practice of the United States Patent Office.

6. The said application for patent has been duly prosecuted in accordance with the law of the United States and

the Rules of Practice of the United States Patent Office, and the Board of Appeals of the United States Patent Office, acting on behalf of the Commissioner of Patents, in decisions dated April 18, 1963 and June 21, 1963, refused said Bach a patent on claims 1, 2 and 5 to 10 inclusive, 12 and 13 of said application for patent; wherefore, being dissatisfied with the decisions of the Board of Appeals, the Plaintiff brings this action.

7. No appeal was taken to the Court of Customs and Patent Appeals from the decisions of the Board of Appeals.

8. The Commissioner of Patents contends: (a) that claims 1, 2 and 5 to 10 inclusive, 12 and 13 are unpatentable on the grounds that they are based on an insufficient disclosure; (b) the claims 1, 2 and 5 to 10 inclusive, 12 and 13 are unpatentable on the grounds that they are indefinite and that they fail to clearly point out the invention; and (c) that the claims 1, 2 and 5 to 10 inclusive, 12 and 13 are unpatentable over Poullain U. S. patent No. 1,143,316 dated June 15, 1915; or Evans U. S. patent No. 2,109,474 dated March 1, 1938; or Jeffree French Patent No. 1,112,429 dated November 16, 1955.

9. Plaintiff disagrees with these contentions of the Commissioner of Patents and contends that the rejected claims are based on a sufficient and proper disclosure, that said claims are not indefinite and they do not clearly fail to point out the invention, that the rejected claims patentably distinguish from the prior art, that said claims are patentable to Plaintiff as assignee of said Bach and that said claims are properly presented in said Bach's application for patent.

Wherefore, the Plaintiff prays that his Honorable Court decree that the Commissioner of Patents be directed to allow the aforesaid rejected claims and be authorized to issue to Plaintiff, as assignee of said Bach, a patent on the above designated patent application Serial No. 687,821, including said rejected claims and such other claims as upon hearing the Court may find patentable.

COMPAGNIE DE SAINT-GOBAIN,

By JOHN L. SEYMOUR,
Counsel for Plaintiff,
30 Rockefeller Plaza,
New York 20, New York.

N. D. PARKER, JR.,
Solicitor for Plaintiff,
1518 K Street, N. W.,
Washington, D. C.

Answer to Complaint.

To the Honorable the Judges of the United States District Court for the District of Columbia

1. The defendant admits the allegations of paragraph 1 of the complaint.

2. The defendant admits that he is the Commissioner of Patents of the United States, and is sued as Commissioner of Patents of the United States. The defendant denies that he is a legal resident of the District of Columbia. The defendant states that he is an official resident of the District of Columbia.

3. The defendant admits that this is an action under the Patent Laws of the United States, and particularly under Section 145 of the Patent Act of 1952, Public Law 593, 82nd Congress, Second Session, Chapt. 950, 66 Stat. 792, Approved July 19, 1952. The defendant asserts that, otherwise, he is without knowledge or information sufficient to form a belief as to the truth of the allegations of paragraph 3 of the complaint.

4. The defendant admits that on October 2, 1957, plaintiff's assignor, Guy Bach, filed an application for patent in the United States Patent Office for "Optical Apparatus", and said application was assigned Serial No. 687,821. Otherwise, however, the defendant denies the allegations of paragraph 4 of the complaint.

5. The defendant denies the allegations of paragraph 5 of the complaint.

6. The defendant admits that the Board of Appeals of the United States Patent Office, in decisions dated April 18, 1963 and June 21, 1963, refused said Bach a patent on

claims 1, 2 and 5 to 10 inclusive, 12 and 13 of said application for patent; wherefore, the plaintiff brings this action. Otherwise, however, the defendant denies the allegations of paragraph 6 of the complaint.

7, 8. The defendant admits the allegations of paragraphs 7 and 8 of the complaint.

9. The defendant denies the allegations of paragraph 9 of the complaint.

Further answering, the defendant asserts that the plaintiff is not entitled to a patent containing any of claims 1, 2, 5 through 10, 12 and 13 of the application involved in this civil action, for the reasons given and in view of the references cited in the Examiner's answer and the decisions of the Board of Appeals in that application. Profert hereby is made of copies of the said answer, decisions, and references.

Respectfully submitted,

C. W. Moore
Solicitor, United States Patent Office
Attorney for Defendant

Excerpts From Transcript of Proceedings Before District Court on March 1, 1965.

(6) OPENING STATEMENT ON BEHALF OF THE PLAINTIFF.

Mr. Seymour: This, Your Honor, is a panfocal lens.

The Court: What does panfocal mean. I know "pan" means "all".

Mr. Seymour: That is right.

Does Your Honor wear bifocals?

The Court: Yes.

Mr. Seymour: Well, a bifocal has one lens at the top—

The Court: I don't like them either. That means you have a different focus here to here (indicating).

Mr. Seymour: That is right.

The Court: Here to here (indicating) is really window glass. There is a line through here (indicating) and when I look at you you are blurred, and now you are very clear.

Mr. Seymour: And there is a line which divides these things.

The Court: There is.

Mr. Seymour: Now they went to the extent of making trifocal lenses in which they had three lenses, one above the (7) other.

The Court: I have seen illustrations of them.

Mr. Seymour: Now the idea of the panfocal lens is that you have the lens so constructed that it gives you full vision at great distances at the top of the lens, and then there is a graduated change of power from the top to the bottom of the lens, so that when the eye gets down to reading through the bottom of the lens you can read close to.

Now this is a panfocal lens of that kind. There is a progressive change in power from the top of the lens to the bottom. At the top of that lens, Your Honor, there is a single mark, and at the bottom there are three marks, I believe.

The Court: I tried it wrongly.

Mr. Seymour: So if you hold it up you will see through the top of it at a distance; and if you turn your eye down so that you look through the bottom you will find that you can see close-up.

The Court: All right.

Mr. Seymour: Now this is something of an optical phenomenon figure, Your Honor, and I am going to take a little time—

The Court: Does this go to the making of contact lenses too?

Mr. Seymour: I don't know that they have ever done (8) it. I wouldn't want to say yes or no.

The Court: Well, I talked about it with my doctor one time. I don't want contact lenses, but I said to him, suppose that your eyes are perfectly good to see, but for reading you need something; how do they do that in contact lenses? He said, exactly the same as they do here.

Mr. Seymour: I would doubt—

The Court: I can't understand it.

Mr. Seymour: Yes, I would doubt you could do it with contact lenses, because the contact lens restricts the amount of the lens through which the eye can see to a very tiny area. I would think that this would have to be on an off-the-eye lens.

The Court: I see.

Mr. Seymour: Now this subject of optics, Your Honor, is one which is rather difficult to go into, so if you will bear with me—

The Court: I will be glad to.

Mr. Seymour: I will try to take you step by step in and, I am sure if I make any mistakes Mr. Cochran will check me on them.

The Court: You are right there too. He will.

Mr. Seymour: We start off with a term "stigmatic". Now Your Honor has heard of anastigmatic lenses for cameras—

(9) The Court: Yes. I know what astigmatism is too.

Mr. Seymour: You know what astigmatism is.

The Court: Yes.

Mr. Seymour: Now stigmatic means that a lens will focus on the retina of the eye so that everything you see is clear. Now that is a stigmatic lens. Now when the rays of light come through a lens and some of them focus on the retina and some of them do not focus on the retina, this is called an astigmatic lens. There are many kinds of astigmatism. For example, there is wild astigmatism, in which you may say that the thing is not a lens at all, because all different parts of the lens will focus on different places with no order involved, so that through such a piece of glass you could see practically nothing. Then there is astigmatism which corrects for an imperfection of the lens of the eye.

For example, you may have a lens of the eye which has become warped or damaged, or something of the sort, and doesn't focus correctly; and the optical industry and eye doctors can take a piece of glass and make you a lens which will correct for the astigmatism of the lens of the eye.

Now in talking about this word "astigmatism" we have to make one very clear distinction. And that is you can speak of the astigmatism of the lens or you can talk about the (10) astigmatism of the eye. And in listening to this case, Your Honor will want to be sure that you understand whether our witnesses are talking about the astigmatism of the lens or the astigmatism of the eye.

Now if you take the lens, not only does the lens have what we will call a general astigmatism which relates to its focussing on the retina, but it will have an astigmatism of the outer face, the one away from the eye, and one of the inner face. So you can see that we are already in a complex field just about the words astigmatic and astigmatism.

The Court: My notion of astigmatism was that the eyes don't match, they are not focussing right.

Mr. Seymour: No, I think that has another term. We are talking about just one eye now. When the two eyes are different I believe there is another name for that; but we are not at the moment concerned with that.

Now among oculists the term "astigmatism" generally means a difference in the sharpness of focus.

The Court: That is just what I said, wasn't it?

Mr. Seymour: Horizontal and vertical lines in the image—

The Court: Yes.

Mr. Seymour: And when you have gone to your eye doctor you have, undoubtedly, sat before one of his (11) machines and he twirled some gadgets and you have seen some very strong vertical lines and very weak horizontal lines, and he works around until he gets them of equal power, so to speak, so that they appear of equal density.

Now the next step in this business of astigmatism is what is called the anastigmat lens.

The Court: The what?

Mr. Seymour: Anastigmatic. It is a term which was generated by the camera industry. In making their earlier lenses they made lenses which were chromatic. They sort of had a prismatic effect of dividing the rays up into different colors; and some of these colors would focus accurately on the retina and some would focus a little before it and some a little aft of it. So that while these lenses sometimes gave exquisite results from the standpoint of art they were not very clear in outline. So the camera industry—

The Court: That could be seen in the experiments they made to make color television. I watched it up at Princeton.

Mr. Seymour: Oh, is that so?

The Court: Yes.

Mr. Seymour: So they took one lens and put another lens on it, and they put another lens on that and another lens on that until finally they got all these lenses (12) combined into these things which you will see which are this thick (demonstrating), some of them. And all the colors were then brought to focus on the retina in the correct place; and this gave lenses which were extremely accurate in definition. Maybe not quite as good artistically as some of the others but as far as definition was concerned quite superior.

The Court: And that is clear-cut, the black and white, even yet?

Mr. Seymour: Yes, sir.

The Court: Go ahead.

Mr. Seymour: Now the first question which arises is not the study of the manufacture, because we are not concerned here with the manufacture of the lens, we are concerned with the lens itself and its description. So that the claims which are before Your Honor are all claims which are drawn to the distinctive characteristics of the lens itself. So the thing which is at issue is the lens which is before the Court.

Now the panfocal lens must vary regularly in power from the top to the bottom. If it does not vary regularly this way, then you will find that you have the same annoyances which you do with a bifocal. There will be a line of demarcation.

(13) The Court: It is an abrupt change.

Mr. Seymour: An abrupt change. So that we come to a word which is called diopter.

The Court: What?

Mr. Seymour: A diopter. Now this is something we are going to run against here and—

The Court: Diopter?

Mr. Seymour: It is d-i-o-p-t-e-r.

The Court: All right.

Mr. Seymour: A diopter is a refractive power of a lens whose focal length is one meter. In using the term optically, it is defined as the reciprocal of the focal length measured in meters. And it is expressed mathematically as 1 divided by the focal length.

Now the problem is sufficiently difficult when we consider the lens from the top to the bottom of making these variations in diopters or the power of the lens, if you will, so that it will vary regularly from the top to the bottom. But at the same time we must have it so that the area of the lens which is horizontal, regarded as horizontal, must not vary, so that you can look from one side to the other as long as you stay at one level and see everything clearly.

So we have here a very difficult problem of (14) maintaining equal power from side to side while making a regularly graduated power from the top to the bottom.

I might say that the bare idea, without any accomplishment, of making a panfocal lens is very old, but it has been one of the most difficult of all problems to solve in the field of optics, the making of the panfocal lens.

The Court: Is this in commercial production?

Mr. Seymour: In France, not here. It is not in commercial production in this country. That lens which Your Honor has there is the only lens of its kind which is in the Western Hemisphere, so far as I know.

Now I have told you some of the problems which go into it. Now then there comes the problem of correcting for simple farsightedness. Now this is the simplest of all the problems which is to be solved by the maker of the lens and by the formula of the lens. So that if you have no astigmatism in the eye itself you make this lens so that it will have these powers, increasing power from top to the bottom and equal power from side to side, the power from side to side being equal throughout each level; or at least through those portions of the glass which are used by the eye, because there are rim portions around here where it (15) doesn't make much difference.

The Court: I can see the rims on these glasses I have.

Mr. Seymour: Yes.

The Court: And I don't like it.

Mr. Seymour: That is right.

The next problem which is to be solved is where there is what we will call a simple astigmatism of the eye. And that means that in addition to correcting for farsightedness you must also impose a correction for the astigmatism of the eye.

Now the first claim which we present to the Court today deals simply with the basic principle which makes all this possible. The second claim adds to it another principle, the third claim another principle, etc., so that when we get through we have corrected for the astigmatism of the front face, the astigmatism of the rear face, and the astigmatism of the eye, including what amounts to a rotary defect, where the vertical and horizontal axes of the lens of the eye are not actually vertical or horizontal, but they may be tilted a little bit like this (demonstrating). And then you have to correct for what I call rotation in order to bring that back so that the axes are again vertical and truly horizontal. These things (16) are not too difficult when you are dealing with an ordinary lens, but when you are dealing with a panfocal lens, the peculiar construction of the panfocal lens makes that correction a very important problem. And they have solved it in this case.

The Court: Has this been patented in France?

Mr. Seymour: I believe it has, Your Honor. At least it was filed in France so long ago that I am sure the patent must have issued by now; and I imagine that it has been patented in many other countries as well. I think there will probably be a list of the countries in which applications were filed in the record as presented to the Court.

We now have to come to another word. There is the word "meridian". We are going to have to talk about the meridian, and if you think of the world with the meridian running from the North to the South Pole this is correct for the lens of the glass, because the meridian in the eyeglasses which Your Honor is wearing is a vertical line which goes right straight through the center of your field of vision. And it is a vertical line made by the intersection of a vertical plane containing the optical axis of the eye and the surface of the lens. So the meridian is this line, this imaginary line, which runs from the top to the bottom right in front of your eye. Another problem which has (17) greatly concerned this is— I have lost my thread of thought for the moment, Your Honor. The situation of the optical industry of the word is such that all lenses must be made as surfaces of revolution. Your Honor, to understand what a surface of revolution is, you can think of it being made on a rotary machine so that a man doesn't have to polish the thing by hand.

You must make these eyeglasses on a rotary machine and you must make them as what are known as surfaces of revolution. It does no good to make the thing by hand because that is of no use to the world in general. There aren't enough people to make enough lenses.

The Court: Is that what they call the grinding of the lens?

Mr. Seymour: Yes, the grinding of the lens must be done as a surface of revolution. Now you can grind it by hand by just simply putting it down and going through certain motions, but that is unsatisfactory in result and not adapted to our present means of operation.

So to make these lenses useful to the general public, it was necessary not only to make a lens which had these various properties but which could be turned out as surfaces of revolution. That is the outer face must be a surface of revolution and the inner face a surface of (18) revolution. And if they are made with a formula which adapts it to that manufacture then you can use ordinary optical machinery to produce these things in accordance with the formula for the lens.

Now when I say formula for the lens, when you go to your eye doctor he studies your eye and then he writes out a formula which you take to the optician and the optician grinds the lenses. The lenses usually come to him partly ground, or a lot of them now don't bother to do any grinding themselves, they simply send it to one of the outlets of the gigantic lens companies of the country and let them do the whole thing and the oculist just mounts it in the frame. But in order to do this there was a problem which had to be solved, in this case, of how to make the formula of the lens such that it could be produced as a surface of revolution. That is, not one face but both faces must be produced as surfaces of revolution.

Now there are another couple of ideas which I must draw your attention to, and one is the word "tore" or "torus".

The Court: How do you spell it?

Mr. Seymour. T-o-r-e or t-o-r-u-s. The word "tore" is preferred, although I think that most people will use the word "torus" rather than the word "tore".

(19) The Court: Well "tor" is sometimes known as an elevation.

Mr. Seymour: Yes, that is correct. That is t-o-r.

The Court: Yes.

Mr. Seymour: This is t-o-r-e.

The Court: Yes.

Mr. Seymour: Now, if your Honor will look at that (indicating) that is approximately a circle, the rim of this cup. May I borrow a pencil, please?

(The Deputy Clerk handed counsel a pencil.)

Mr. Seymour: If I take a line here (indicating), imagine that this pencil is a line, and put it right through a diameter the result you get is a spherical surface and we do not regard this as a tore.

In other words, if I take this and turn this cup around, this upper half will, what we call, generate a surface which is a hemisphere. That is this (indicating). And that is not regarded as a tore because this line is going through the axis of the circle.

Now if we shift this line off of the axis of the circle like this (demonstrating) so that it is, in effect, a secant and not a diameter, and then we spin this around this line like this (demonstrating), we generate a surface (20) which is a tore. So that you can think of a tore as being a surface which is generated by the arc of the circle which is pivoted around an axis of a revolution other than the diameter.

In other words, if you spin this around an axis you have an axis of revolution about which it turns. This is the axis of revolution (indicating) about which it turns. Now if that axis of revolution is offset so that it is not a diameter, then the surface which is generated by this line is a tore.

We are now getting down rather close to what this invention is itself. I have been leading up to it with these terms. I have in my pretrial brief written these things out in some detail in Section I so that your Honor will be able to refresh your mind on these things which I have been talking about now.

Now I am going to read the first claim to your Honor and explain the claim to you with relation to the invention as a whole so that you will understand what it contains.

Now this first claim was intended to include a specific definition of that part of novelty which was necessary to the manufacture of this panfocal lens. This is the element which made all which follows it possible.

(21) "A panfocal lens made of transparent refringent material have an index of refraction *n*, the lens having a first and a second main face." Now we call the outer face the first main face and the inner face the second main face. "Both such faces being surfaces of revolution." This is a distinctive characteristic of this Bach lens. The inventor of this lens is named Bach, B-a-c-h, and this is a distinctive characteristic of his lens, that both of these surfaces, the first and second, the outer and inner, are surfaces of revolution. No other lens has ever achieved that in a panfocal lens. "The first face"—that is the outer face—"having a meridian whose curvature varies in a continuous manner"—that is from top to bottom—"said first face having a constant astigmatism in at least one region of substantial area of its surface."

Now what that means is that there is in the region through which you look a constant astigmatism of that face. Not of the lens as a whole, but of that face. And that constant astigmatism of that face is the thing which made this panfocal lens possible; and it also is the thing which made it possible to use surfaces of revolution for both faces of the lens.

So that in this first claim we have expressed the basic novelty which made the whole thing possible.

(22) Now in the second claim we have:

"A lens as defined in claim 1 wherein the first face is of such configuration that at all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridian and in a plane containing the radius R and lying perpendicular to the meridian plane are different, and substantially satisfy the equation:

$$\frac{r-1}{R} - \frac{r-1}{R'} = \text{a constant, K,}$$

K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters."

Mr. Cochran: If your Honor please, I would like to break in. The claim has been read incorrectly and perhaps we should straighten it out now. It was stated that it was $\frac{r - 1}{R}$. Actually it is $\frac{n - 1}{R}$.

Mr. Seymour: Yes. I am sorry. I was reading without my glasses and did misread. It is $\frac{n - 1}{R}$, *n* being the index of refraction. The index of refraction minus 1 divided by the first radius minus the index of refraction minus 1 over the second radius equals a constant K. And this is a definition in terms of mathematics of this front face of the lens so that you do actually get a constant astigmatism in this central area through which you look.

(23) The Court: Do you get that from any of the prior art?

Mr. Seymour: No, sir.

The Court: In any of the references?

Mr. Seymour: No, sir.

Now take our Claim 1. There is no reference which has a constant astigmatism in at least one region of substantial area of its surface for the front face, and there is no reference in which both faces are surfaces of revolution.

The Court: Do you say one meridian?

Mr. Seymour: Constant astigmatism in at least one region, one region of substantial area of its surface. Now that is novel, having the constant astigmatism on the front face. And having that constant astigmatism it then becomes possible to make the lens with both faces surfaces of revolution. In other words, you can turn out the lens—

The Court: Does any prior art show that?

Mr. Seymour: No, sir, that is not shown by the prior art. There is one reference, I believe, which states that he makes the lens as surfaces of revolution but he does not show how it can be done; and our witnesses will demonstrate that to the Court.

There are two references which admit that only one of the surfaces is a surface of revolution; and I believe (24) the second one claims that both are surfaces of revolution but shows no method by which this can be attained and cannot attain it. We will prove that to your Honor by testimony.

The Court: That would not be known to anyone skilled in the art?

Mr. Seymour: That is right. It would not be known to anyone skilled in the art.

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The Court: Is there any lens made outside of this which is ground out of a single piece of glass which has (25) the function of bifocals without lines?

Mr. Seymour: No, sir.

There is a lens which is ground out of a single piece of glass which is a bifocal lens. It has one lens above and another lens below. And they are united. But you have the same difficulty with that lens as you do with the lens you are wearing now.

The Court: There is no gradual change?

Mr. Seymour: There is no gradual change. It is just a sudden shift from one power to another. It is just a bifocal like any other only it is made out of a single piece of glass.

Now our scheme of claims, therefore, begins with the basic principle in claim 1.

It gives the mathematical definition of that basic principle in claim 2, that is what you might call a doctor's prescription for the lens.

And in claim 3 it says:

"A lens as defined in claim 2 wherein the lens is adapted to correct astigamatism as well as farsightedness of the eye, and the second face of the lens is an astigmatic surface resulting from the composition of two component surfaces, one of said two component surfaces having an astigamatism equal to —K," K being the constant in claim 2, (26) "and the other of said two component surfaces having an astigmatism equal to and opposite from that of the eye to be corrected."

Now every now and then in my brief I have tried to simplify this thing, and when I got through with my simplification I had to go back and say that the description in the specification is the best description that there is. I have not been able to improve on it, even though I have tried in order to simplify it for the Court.

(27) The Court: Have you anything to say at this time, Mr. Cochran?

Mr. Cochran: Just a short statement as to what the grounds of rejection are, Your Honor.

Opening Statement on Behalf of the Defendant.

Mr. Cochran: There are three grounds. The first is that the specification doesn't meet the requirements of Section 112 of Title 35. For one thing, the Examiner pointed out that the specification is at variance with the limitation in the claim to constant astigmatism. The specification would seem to say, as the Examiner pointed out, that this is a condition which cannot be achieved. It is something that you can only approximate.

For another thing, there is no specific embodiment (28) of the lens disclosed in the specification; and we think that the evidence will show that the directions in the specification are not sufficiency specific that you could arrive at one.

Now as to testimony which Mr. Seymour suggests will be offered on the question of the sufficiency of the specification, that type of evidence, as Your Honor knows, should be received with care under the doctrine of Watson versus Beresworth and preceding cases, that the language of an application specification and the claims raise a question of law for the Court. Certainly it would be improper for you to receive evidence on the exact point in issue, that is the sufficiency of one skilled in the art.

The Court: Why?

Mr. Cochran: Because this is the point of law Your Honor to decide.

The Court: How can the Court decide a point of law without getting the facts upon which to decide it.

Mr. Cochran: It would be proper, I suggest, to receive evidence as to the underlying facts, but on the exact point in issue that must be left to Your Honor.

Now there is a second ground, that the claims are indefinite and that they fail to point out the invention.

Now here the objection is that the claims call for a desired property, that is this constant astigmatism in (29) a panfocal lens. The Examiner took the view that this set forth the property which was known to be desired in the art and went no further. Of course, this would make the claim indefinite and it does not point out what was actually invented. If the invention here is in a method, article claims are improper.

The third ground is under Section 103, that is obviousness in view of cited prior art. There are three patents, Evans, Poullain and a Jeffree patent. The Jeffree patent is a French patent. Now we have supplied in our exhibit a corresponding British patent specification which conforms in all material respects because it has a date which was sufficiently early. I have had the specification of the British patent checked against the French patent by our translators and it conforms in all material respects. So you can take that as a translation of the French patent.

I believe it is unnecessary, Your Honor, to go into detail on our grounds on each one of these patents.

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(30) Mr. Seymour: Will you take the stand, please, Dr. Scholes.

Thereupon—

DR. SAMUEL R. SCHOLES

was called as a witness by and on behalf of the plaintiff and, having been first duly sworn, was examined and testified as follows:

Direct Examination by Mr. Seymour:

Q. What is your name, your age, your occupation and your address? A. My name is Samuel R. Scholes. My age is 81. I am a retired college professor engaged from time to time in consultation.

Q. Will you give the Court a sketch of your history, particularly with relation to your knowledge of the subject of optics? A. I am a graduate of Ripon College in Wisconsin. I have a Doctor of Philosophy Degree from Yale University. I have taught between those two educational adventures high school physics. I have also given lectures in later years on physical optics. I was with the Mellon Institute for several years. I was chemist and technical director of several glass companies for about 20 years; and I occupied (31) the Chair of Glass Technology at the College of Ceramics at Alfred University with an interim being Dean and altogether totalling a period of 20 years. I retired in 1952.

Q. What honors have you received, Dr. Scholes? A. In that same year I received the Bleininger Medal for achievement in ceramics presented by the Pittsburgh Section, American Ceramic Society. I received the Honorary Degree of Doctor of Science from Alfred University. A few years later I was made one of ten living honorary members of the American Ceramic Society.

The Court: Dr. Scholes seems to be eminently qualified, Mr. Seymour.

Mr. Seymour: Yes, Your Honor.

By Mr. Seymour:

Q. Have you ever worked in the making of lenses as an occupation? A. I have not.

Mr. Seymour: Your Honor, I suggest that Dr. Scholes is quaified as a person skilled in the art but not as an expert.

By Mr. Seymour:

Q. Now have you read the specification of the Bach lens, the application which is before the Court? (32) A. All of the specifications and the claims have been read to me.

Q. Will you tell the Court why you did not read them yourself? A. I have what is called a semi-degeneration of the retinas to such an extent that my central vision is too dim to permit reading without great effort or magnification.

Q. Did you understand the description of the Bach lens as it was read to you from the specification? A. I did.

Q. Will you tell the Court what you understand the Bach lens to be? A. The Bach lens is a lens which has from one edge to the other, let us say in a vertical direction, an increasing curvature on the outer face or surface. That is the vertical curvature. The lateral curvature also varies from one edge to the other in such a manner as to provide a constant degree of astigmatism.

That is to say, the diopter power of the lens at any point read in a vertical or meridianal direction is not the same, that is it is less than the diopter power read along parallels or in a horizontal direction, the idea being, in the first place, that the lens should be panfocal. That is, provide a gradually and continuously (33) increasing degree of magnification from top to bottom.

Q. Now do I understand that what you have said just now is that the front face of the lens has a constant astigmatism in at least one region of substantial area of its surface? A. Yes, that is it. In fact, I should think that that constant astigmatism, very small, however, is over the entire front surface.

Q. Have you read the three references which are in this case?

The Court: He probably had them read to him.

Mr. Seymour: Yes, sir.

By Mr. Seymour:

Q. Have you had the three references in this case, Evans, Jeffree and Poullain, read to you? A. I have.

Q. Do any of those three references have a constant astigmatism in at least one region of substantial area of its front surface? A. None provide that constant astigmatism.

Q. Without that constant astigmatism, can you make a lens both surfaces of which are surfaces of revolution; and I should say a panfocal lens, both lenses which are surfaces of revolution? (34) A. Will you rephrase that question, please? I don't quite follow you.

Q. All right. Is it necessary to have an outer surface provided with a face of constant astigmatism if you are to make the lens with an outer and an inner surface which are surfaces of revolution? So far as you know? A. So far as I know, the constant astigmatism results from a selection of dioptric power horizontally or, perhaps one should say the radii of curvature horizontally that can be provided with the least error. It seems that trying to make is as a surface of revolution and trying to get the same radii of curvature at all points, both East and West and North and South, let's say, would run into a great deal of error.

(34) Q. Was the specification clear to you as it was read to you? A. Yes.

Q. Can you, having been given the instruction which is found in the Bach specification, make a panfocal lens? A. I believe that I could. May I briefly describe what I have seen in the production of spectacle lenses?

Q. Yes. A. Especially as to the outer surfaces. The modern spectacle lens is quite often ground, as we say, toric on the (35) outer surface, and such lenses are produced in quantity and, of course, can be oriented afterwards so that the astigmatism thus produced on the outer surface for the purpose of eye correction can be supplied on prescription to fit the correction or to fit the eye that needs to be corrected.

That grinding of that outer toric surface is accomplished by presenting the lens blank, a flat rather thick piece of glass, to a grinding wheel in the rim of which is a groove of circular sections. The lens blank is held in company with other lens blanks on another sort of wheel called a lap, to which the blanks are cemented and, of course, the radius of rotation of that wheel, that is the lap, is different from the radius of that circular groove in the grindstone; and thus, as the lap turns and the grindstone turns the outer surface is ground into that astigmatic or toric shape. It is ordinarily called a cylinder grinding. Now, if—

Q. Let me ask you a question now. Having been given such apparatus for the manufacture of lenses in general, could you, within your own skills, so modify such apparatus so as to produce the Bach lens? A. Yes. May I go on with that suggestion?

Q. Yes, please. (36) A. I should produce in the rim of that grindstone the curve that I wanted, increasing in curvature from side to side. That would be, presumably, something like what we call the involute of a circle. The lap, instead of presenting both edges of the lens on a cylindrical wheel so that both edges were turned through the same radius of turning, would be frustum of a cone, so that one edge of the lens would be turning through a longer radius than the opposite edge, or in this instance the bottom of the lens. And thus a sharper curvature, greater dioptric power would be less general. Then, of course, there is the polishing to follow which would not change materially the shape of that outer surface that we have imagined.

(37) By Mr. Seymour:

Q. Dr. Scholes, I hand you a lens and I ask you if you have seen that lens before? A. I am quite sure that I recognize this as the one which you sent to me at Alfred.

Q. Did you test that lens on optical instruments at Alfred? A. I used merely what is called sometimes a sphereometer. It is a little instrument with three legs. The middle leg is on a spring and pushes up more or less according to the curvature of the surface, and then the dioptric power represented by that surface is read off on a dial. It is a common way and all opticians use it for checking lenses. It is sometimes called a lens meter.

Q. In the specification there is a complete description of a lens according to the Bach formula. Did you test this lens to see whether it conformed to the lens described in the specification? (38) A. It seems to me that this lens conforms generally but not specifically. That is to say there were certain other numbers appearing in the specification other than the ones I found, but the dioptric power did increase from one edge of the lens to the other; and the dioptric power of the surface from right to left, that is horizontally, was at all points the same number of units greater than the vertical power.

If I may recall those numbers as nearly as may be, the top of the lens indicated something like 5 diopters in vertical curvature and at the bottom 8. In the other direction, at the top the horizontal power was 8 diopters and at the bottom 11 diopers, increasing quite smoothly, of course, as one moved the instrument on the lens.

I must say that those dial readings were made for me with my holding of the instrument on the lens.

(54) Q. So can't you properly say that refraction is a property of the surface?

The Court: Did you say that refraction is the (55) property of the surface—

Mr. Seymour: Yes.

The Court: —Alone?

Mr. Seymour: Yes, the surface alone. If I understand it, refraction is the property of the surface existing between two materials of different source.

The Court: I know, but in a prism you have different angles. You have different planes, have you not? Do you consider each one of those things a surface as it goes in?

Mr. Seymour: Well—

The Court: Well, it seems to me that the Doctor's answer is not in accordance with your question if it is just a property of the surface. Because you asked him when it goes in what; and when it meets another surface it is bent again and again.

Mr. Seymour: It travels through the material in a straight line.

The Court: Yes, but it hits something, doesn't it?

Mr. Seymour: It hits the surface, and it is refracted by the surface, that is it is bent and travels in a straight line, but it is the surface that causes the refraction.

The Court: I don't know.

(56) Mr. Seymour: If it were otherwise, Your Honor, the light would travel in a curve through the new material, but it doesn't, it travels in a straight line through the new material. Then again when it leaves the other surface again it turns off in a different angle but travels straight.

The Court: If what you say is correct, then I didn't understand the Doctor's answer.

Clarify it, please, Doctor. Is it a property of the surface entirely, when it goes in and when it goes out? I thought the light goes out in many ways.

The Witness: It is a matter of a beam of light leaving one medium and entering into another at some angle other than perpendicular or normal. If it arrives normal to the surface it is merely slowed down, and if it arrives at some angle other than normal, then let us say that one edge of the beam is slowed up before the other edge is.

We could illustrate say by a rank of soldiers walking across a lawn and then meeting a wheat field at an angle, and the end of the line that got there first would be slowed down before the others would be slowed down, and if they kept on going with the same effort you would have them going at a different angle through the wheat field. That is rather rough, but it is essentially what happens to your beam of light. And if we say it is the surface it is (57) because we are merely saying that it all depends upon the angle at which the light meets the surface, or at which it leaves that surface and then is bent in another direction back toward its original but not all the way usual.

The Court: I think you ought to repeat your question, Mr. Seymour.

By Mr. Seymour:

Q. The question, Dr. Scholes, is, isn't refraction the property of a surface? A. My answer will have to be that it is a property of the configuration of the surface, as well as the nature of the transparent material.

Q. So that if I understand you correctly, if we had light coming onto a surface of glass at an oblique angle the light would be bent at the surface and would travel at a different angle in a straight line through the glass? A. Yes.

Q. Now, if we in place of the glass were to put a piece of transparent plastic and direct the light upon the surface of the plastic, we would again get a bending at the surface, but the angle at which the light beam travelled through the plastic would be different from the angle at which it travelled through the glass? A. Because of the difference in the refracting power (58) of the two media.

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(59) Dr. John Stull, called on behalf of the plaintiff.

Direct Examination by Mr. Seymour:

Q. Dr. Stull, would you give your name, your age, your occupation and your address, please? A. My name is John

Stull. I am 34. My occupation is that I am Associate Professor of Physics at Alfred University in Alfred, New York; and I live at R.D. 1, Almond, New York, which is near Alfred.

The Court: Where is that place in New York?
The Witness: Alfred.
The Court: Oh, yes.

By Mr. Seymour:

Q. Will you please tell the Court what your experience is in relation to the subject of optics? A. Optics is, of course—and particularly geometrical optics which we are discussing today—a branch of physics; and as a branch of physics it is a topic or group of topics which is included in the study of physics.

My experience has dealt with presenting the subject of physics to undergradute students at Alfred University.

Q. What degrees do you hold, Doctor? A. I hold a bachelor of science degree, the master of science degree and the doctor of philosophy degree from (60) Alfred.

Q. In physics? A. No, in ceramics.

Q. Would I be correct in classifying you then as a man skilled in this art but not an expert? A. Yes.

Q. Have you ever worked in a lens-making factory? A. No, I have not.

Q. Now did you hear the testimony of Dr. Scholes? A. Yes.

Q. Do you agree with what he said, or do you have any reservations with respect to anything he said? A. I guess I could only say at this point that I agree in substance with what he said. If I were to be held to an opinion on this phrase by phrase I would, of course, have to read his testimony. But, in general, yes.

Q. Have you read the specification in this case? A. Yes, I have.

Q. Did you understand it? A. Yes, I did.

Q. Have you read the references in the case? A. Yes, I have.

Q. Have you compared the specification with the references? (61) A. Yes, I have.

Q. Which did you find the clearer in their description of their respective subjects? A. To varying degrees I found that the Bach description was superior to them.

Q. How do you mean by varying degrees? A. Well—

> Mr. Cochran: If Your Honor please. Before the witness ends his answer here—I didn't object before but I think I should raise an objection to a question of this kind. We are concerned here with the sufficiency of the Bach specification itself; and if the Patent Office or if the French Patent Office has issued patents which were insufficient in their disclosure, that is no reason why another patent should issue here.
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> The Court: I know that. What has that to do with this question and whatever answer he may give?
>
> Mr. Cochran: If he believes that the Bach disclosure is more or less clear than any other disclosure—
>
> The Court: He is just talking about the impression on him—
>
> Mr. Cochran: —Is not pertinent.
>
> The Court: —Which is opinion, that is all. Your objection is overruled. Go ahead.
>
> (62) Mr. Seymour: If I may state something in answer to Mr. Cochran, the law requires that the invention be described in such full, clear and exact terms that a person skilled in the art can understand it.
>
> The Court: Of course, that is very obvious. We all know that.

Mr. Seymour: And these men are persons skilled in the art, and they have testified that they understand the invention from having read the specification.

The Witness: I am sorry, but I have forgotten where I was in my answer.

Mr. Seymour: Would the reporter please read the material just preceding the colloquy?

Reporter (reading): "Q. Which did you find the clearer in their description of their respective subjects? A. To varying degrees I found that the Bach description was superior to them.

"Q. How do you mean by varying degrees?"

Mr. Seymour: That is it.

The Witness: I was perhaps being too specific—One of the references—

By Mr. Seymour:

Q. Do you have your copies of the references, Doctor? A. Yes, I do.

(63) Q. Would you get them out, please? A. Yes.

What I am trying to say—and making too long a job of it—is that I found the description in the Bach specification more clear than that in each of the references, but that I found some of the references to be more clear than other references. This may well not be an important fact. I think the answer is that the Bach specification was more clear to me than any of the references.

Q. Thank you. Now, have you read the claims? A. Yes, I have.

Q. Will you take claim 1, for example, and compare it with the reference Poullain? A. The claim 1 of the Bach application and compare it with Poullain. The comparison involves distinctions. First of all, that both surfaces of this lens should be surfaces of revolution.

Q. According to Bach? A. According to Bach; yes. And also that the first surface of the lens of Bach is specified as having a constant astigmatism.

Q. Now what about Poullain? A. Poullain does not specify a first surface having a constant astigmatism. He also does not specify that he (64) will use surfaces of revolution.

Q. Now do you find in Poullain the mathematical description of the lens which is found in Bach's claim 2? A. No, I do not.

The Court: Of course, we are not trying the patentability of Poullain or any of the references.

Mr. Seymour: Well, what I am proving here, Your Honor, is that Poullain does not have the description of the Bach lens as cited in these claims. There is no anticipation.

The Court: Did the Examiner say Poullain has?

Mr. Seymour: Yes, sir. The Examiner says Poullain anticipates this case.

The Court: All right.

Mr. Seymour: He cites the three, and eventually we are going to get around to the Section 103 to prove that not only do they not meet individually but they cannot be combined to meet.

The Court: Very well, proceed.

By Mr. Seymour:

Q. Now would you look, please, at claim 5? A. Yes.

Q. Does Poullain have the subject matter of claim 5? A. No, he does not.

Q. Claim 6? (65) A. Now let's see.

Q. Now keep in mind that claim 6 has— A. No, he did not.

Of course, it contains claim 5, which contains 2 which contains 1. Of course, the answer is still the same.

Q. Claim 7, please? A. Again the answer is the same.

Q. Claim 8? A. The same answer.

Q. Can you give the same answer for all the claims with respect to the reference Poullain, Doctor? A. Yes.

Q. All right, let's go to the reference Evans, if you please. Now will you please tell the Court whether or not the reference Evans meets claim 1? A. No, it does not.

Q. In what way does it fail? A. Precisely the same, two ways. The Bach claim 1 specifies both surfaces being surfaces of revolution. Evans does not do this. Bach claim 1 claims constant astigmatism for the first face. Evans does not.

Q. Will you testify that none of the claims of the Bach case are anticipated by Evans? (66) A. Yes.

Q. Now will you take the Jeffree patent, please?

> Mr. Seymour: It has been agreed, Your Honor, that we may use the British Jeffree reference as a translation of the French.

By Mr. Seymour:

Q. Now, will you look at the Jeffree reference, and have you read it? A. I have read it.

Q. Now would you be good enough to take the Jeffree reference and tell us whether or not it is a complete and comprehensible description of an invention? A. No. The crux of my answer is that Jeffree does not tell me—although he tells me some geometry to do in his specification—why he does it. And I simply, therefore, cannot understand what it is that he is doing.

Q. Now is the reference Jeffree anything more than a series of trials and errors?

Mr. Cochran: This is excessively leading, I suggest, Your Honor.

The Court: It is. Don't lead the witness.

By Mr. Seymour:

Q. Now let us take the Jeffree British patent at page 2 of the complete specification beginning at line 105 and (67) going to line 41 on page 3. Is that subject matter a clear and comprehensible description of a lens or how to make it? A. My answer would have to be, no, that it isn't

This was, incidentally, the part of Jeffree that I was talking about when I said he tells me some geometry to do but he doesn't tell me why and I can't understand it.

Q. Now does Jeffree tell one how he proposes to make a lens? A. How he proposes to make a lens?

Q. To make one, yes. If I may refer to— A. Well, you are talking about making an object now?

Q. Page 4 at the top, if you please. A. All right. Yes, he does tell me, in general, what method he has in mind. In the general case he is thinking of making a mold into which he can pour some transparent plastic which then when it comes out will be a lens.

Q. Now one of the problems which we have discussed in connection with this invention concerns the making of corrections in lenses for astigmatism of the eye. A. Yes.

Q. Can Jeffree make such corrections? A. He proposes to make such corrections in the cast plastic lenses that he talks about. The way in which he (68) proposes to do this is to take the two surfaces which he discusses in the main part of his specification, the combination of which does not contain astigmatism, and then in order to correct for the astigmatism of the given eye to add mechanically to the model which he has made and from which subsequently his mold will be made a correction for astigmatism.

Now he suggests as an example that this correction be made by producing what is essentially a cylindrical lens of some elastic material. He suggests gelatine. Which then will be cemented to the model which he has made using the curves covered in his main specification. From this then he will electroplate metal onto the model, and by techniques which are known he will make the two halves of a mold which will then serve as the mold for the lens that he will subsequently get.

* * * * * *

69 [Afternoon Session
1:50 p. m.]

* * * * * *

Q. Now, Dr. Stull, I believe you testified that you are familiar with the Evans and Poullain references? A. Yes.

Q. Can you take anything out of Evans and add it to what is in Poullain and make a Bach lens? A. No.

Q. Reversing it, could you take anything out of Poullain and add it to Evans and make a Bach lens? (70) A. Perhaps I can save time. I can't take anything out of any one of the three and add it to anything out of any other of the three and make a Bach lens.

Q. I think that is a very complete answer. Thank you. In what way are they all deficient, all these three references? A. The two main ways, the ones that I said before, the absence of surfaces of revolution and the absence of the constant astigmatism.

Mr. Seymour: I think that terminates the direct examination, Your Honor.

The Court: Cross examine, Mr. Cochran.

Cross Examination by Mr. Cochran:

Q. Now with reference to the Poullain et al. reference, Dr. Stull, I believe you said that it does not specify surfaces of revolution? A. Yes.

Q. Does the patient disclose any conditions under which a surface of revolution would be produced in the surface of progressively increasing curvature? A. No.

Q. Would your testimony be the same as to Evans? A. Yes.

Q. And to Jeffree? (71) A. Jeffree does talk about surfaces of revolution, yes.

Q. What does he say about them? A. He said that both of his faces are surfaces of revolution. As I look at the Jeffree patent, however, I have to think about the correction of a given eye for whatever errors it may have; and in the general case of a given eye he does have to depart, as he states, from these surfaces of revolution. Specifically in the case of, I believe, oblique astigmatism.

• • • • • •

(74) Re-direct Examination by Mr. Seymour:

Q. There is a table there which describes in great detail the construction of the lens, and I would like to know if from that table you can determine where the O—X axis is? A. Oh, yes, because the columns are headed X and Y and these give the Cartesian coordinates of those points. And if you plot these on a set of Cartesian axes X—Y axes, then the O—X axis is uniquely determined even for my fussy mathematical friends.

Plaintiff's Proposed Findings of Fact and Conclusions of Law.

1. The term ''panfocal lens'' as used in claim 1 is clear in meaning. It means a lens which increases in power regularly along the meridian, from one edge of the lens to the opposite edge. Usually this means that one can see clearly at a distance through the top of the lens and close-to at the bottom. The power of a lens is measured in diopters. A diopter is $\frac{1}{f}$, f being the focal length at the point at which measurement of power is made.

2. The phrase ''the lens having a first and second main face'', as used in claim 1, is clear in meaning. As explained in the specification the first face is the outer face of an eyeglass lens and the second face is the one nearer the eye.

3. The phrase ''both such faces being surfaces of revolution'', as used in claim 1, is clear in meaning. A surface of revolution is, mathematically speaking, one which is generated by rotating a curved line about a straight line which lies in its own plane. This is shown in Fig. 5 of the case at issue where the curved line (C) A M_1 M_3 M_2 B is rotated about the axis line O'_1, O'_3, O'_2; in Fig. 4 where the line C is rotated about axis O X; and also in Fig. 6.

Dr. Scholes also established this under cross-examination (Transcript of Hearing, p. 51 second question to p. 52 second question).

The advantage of designing a lens both surfaces of which are surfaces of revolution is that they can be turned out on ordinary optical lens grinding machines (Transcript of Hearing, pp. 35, 36).

(A) It is established by the testimony of Dr. Stull under cross-examination that Evans does not have a first or outer main face which is a surface of revolution (Transcript of Hearing, pp. 71-74).

(B) Comparison of Fig. 1 of the reference Poullain with Figs. 5 and 6 of Evans shows that Poullain's construction is mathematically the same as Evans. This is also demonstrated by the Examiner on page 2 of the Examiner's Statement. It is, consequently, establish by the testimony of Dr. Stull and by the Examiner's Statement that Poullain does not have a first or outer main face which is a surface of revolution (Transcript of Hearing, pp. 71-74).

(C) The reference Jeffree was not comprehensible to the witness Dr. Stull. The meaning of the material at the heart of the Jeffree patent, from page 2, line 125 to page 3, line 59, is not self-evident. Dr. Stull's testimony stands unrebutted (Transcript of Hearing, pp. 66, 67, 68, 69, 70). The reference Jeffree must be deemed a nullity.

The reference Jeffree asserts the use of surfaces of revolution but does not describe how such surfaces are to be obtained. He assumes that they exist (p. 2, line 51) and proceeds to describe a manual method, using a gelatine build-up, by which astigmatic correction can be introduced (p. 2, lines 53 et seq.). Dr. Stull testified that the method does not involve surfaces of revolution (Transcript of Hearing, p. 70).

The evidence is unrebutted and it is that Jeffree lacks a description of surfaces of revolution.

Jeffree does not recite constant astigmatism of the front face of his lens. It is not self-evident that his lens would have constant astigmatism. The witnesses testified that it does not have it and their testimony is not rebutted.

(D) No reference shows the two surfaces of revolution required by claim 1.

4. The phrase "said first face having a constant astigmatism in at least one region of substantial area of its surface" is clear and comprehensible. It is accurately and

mathematically defined in the specification of the application. A formula is given "(1)" by which it may be determined. It need not be mathematically precise for eyeglasses, being satisfactory for that use if K of formula "(1)" "varies within a range of ¼ diopter" (specification, p. 4).

Both witnesses found this phrase to be clear and comprehensible, and further testified that no reference describes a first face having a constant astigmatism. There is no contrary evidence.

5. No reference discloses a panfocal lens which has an outer face which is a surface of revolution, or which has constant astigmatism of its outer face. As these features are both recited as novel characteristics of applicant's lens, and as claim 1 contains both, claim 1 is not anticipated by any reference or combination of references.

6. It is not self-evident that constant astigmatism of the front face of the lens is inherent in any reference. Not being described and not being self-evident all the references are fatally defective.

7. It is not self-evident that any reference employs two surfaces of revolution.

8. It is not self-evident that constant astigmatism or surfaces of revolution are necessary to all panfocal lenses. If the references have panfocal lenses of a sort, they are not panfocal lenses of applicant's novel type.

9. The Board of Appeals based its decision on a point which the Examiner had declared not to be at issue, and the Solicitor fell into the same error at page 29 line 5 of the Transcript of Hearing.

Plaintiff's Proposed Findings of Fact and Conclusions of Law.

10. The Board of Appeals failed to exercise its appellate jurisdiction to resolve the questions which were at issue between the Examiner and the applicant.

11. After the plaintiff had presented its evidence it had established a prima facie case showing that the meaning of the claims is clear, that the specification supports the claims (a fact in which the Board's decision concurred at page 4 in these words:

> "We find the claims using the same terminology as in the specification. . . .")

that the meaning of both is clear to persons skilled in the art, that there is no anticipation under Section 102, and that there is no obviousness under Section 103, the burden of proof shifted to the defendant to justify each of its rejections.

It had been expected by the Court (Transcript of Hearing, p. 29, line 6 up) that the defendant would justify each rejection by evidence but it was not done. It presented no witnesses, the cross-examination was obscure, and the only part of it which was specific to, and recognizable as pertaining to a particular reference or rejection was made so by the witness Dr. Stull, and that demolished a major contention of the defendant.

12. The evidence presented by plaintiff stands unrebutted, the claims state a novel invention, the decision of the Board of Appeals is reversed, and the claims are allowed.

John L. Seymour, Esq.,
Bauer & Seymour,
Attorneys for Plaintiff.

Opinion of the District Court.

This is a civil action under 35 U.S.C. § 145 in which plaintiff, assignee of Guy Bach's application Serial No. 687,821, filed October 2, 1957, entitled "Optical Apparatus", seeks an adjudication that it is entitled to receive a patent for the invention specified in Claims 1, 2, 5-10, 12 and 13 of the Bach application, which is entitled under 35 U.S.C. § 119 to the rights of priority of two French patent applications filed October 6, 1956, and August 13, 1957.

Claim 1 is illustrative of the invention and reads as follows:

> 1. A panfocal lens made of transparent refringment material having an index of refraction *n*, the lens having first and second main face, both such faces being surfaces of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface.

The references relied upon by defendant in rejecting plaintiff's claimed subject matter as obvious and unpatentable under 35 U.S.C. § 103 are the following:

Poullain et al.	1,143,316	June 15, 1915
Evans	2,109,474	March 1, 1938
Jeffree (France)	1,112,429	Nov. 16, 1955

(Corresponding to Jeffree-British Patent No. 775,007, May 15, 1957.)

Evans discloses a panfocal, or multifocal lens which "varies in dioptric power from top to bottom with the near vision at the bottom". At least one of the two surfaces of the Evans lens, namely the inner surface, may be a surface of revolution, as indicated by the statement that

"It is obvious that a lens of limited characteristics could be generated about one axis of generation, the dioptric power of which lens would vary gradually from one edge to the opposite edge". Evans teaches that "the vertical curvature of the inner or concave surface of the lens . . . might be an involute or other suitable curve," which is essentially equivalent to plaintiff's claim limitation of "a meridian whose curvature varies in a continuous manner" for the outer or first face of the claimed panfocal lens. This 1938 patent on a panfocal spectacle lens also discloses that "if required, this graduated focal grinding can have a different dioptric power horizontally than vertically at the same point in order to correct astigmatism, etc."

Poullain et al. disclose a multifocal optical lens which "is essentially characterized by this fact that it presents on one of its faces, or on both, surfaces with radii of variable curvature uniformly progressive," which expression is again equivalent to "meridian whose curvature varies in a continuous manner" in plaintiff's claims. Poullain et al. disclose that "the second face" of the lens may be a torus; and the second or inner face of plaintiff's lens is a torus, or toroidal surface. This reference teaches that "in cases where it is at the same time desired to correct astigmation the second surface may be a cylinder or a torus" and that "the correction of astigmation can be introduced" simply "by giving these two radii (in horizontal and vertical perpendicular planes) suitably selected unequal values." Poullain et al. indicate in their 1915 patent that "in order to obtain the surfaces indicated above . . . it would be necessary to have recourse to special machines." These "special machines" would be rotary optical grinding machines, which are readily available today, over fifty years after the Poullain et al. patent was granted.

The Jeffree patent, which the Court considers to be the most pertinent of the three cited references, was published in France on March 14, 1956, only seven months prior to the filing date of plaintiff's first French application.

Jeffree discloses that, "when only one non-sperical surface is used" in a multifocal spectacle lens unwanted astigmatic errors cannot generally be removed. However, Jeffree does not indicate the magnitude of acceptable astigmatic errors, and plaintiff, while likewise indicating in the Bach specification that "in practice, the desired constant value of astigmatism can only be approached," asserts that astigmatic errors of up to ¼ diopter are acceptable for corrective eyeglasses as substantially "constant" astigmatism. It is reasonable to infer that when more than one "non-spherical surface" is used, and Jeffree indicates that his "other surface" may be "toroidal" like Bach's, then it should be possible to achieve the desired result of substantially constant astigmatism in a panfocal lens. Jeffree teaches that each of his two "asperical" or non-spherical surfaces may have its own independent astigmatism by stating that "in accordance with the invention, there is provided a multifocal lens having its positive power increasing gradually from top to bottom in the vertical meridianal plane, each surface being aspherical and having, for each point on both of its surfaces, the horizontal curvature greater than the vertical curvature."

Jeffree anticipates one major element of plaintiff's claims, i.e., that *both* surfaces are surfaces of revolution, as shown by the following excerpt:

> "The simplest lenses according to this invention are those wherein both surfaces are surfaces of revolution. In general, since corrections for visual astigmatism have to be incorporated, the surfaces are conveniently those that are derived from surfaces of revolution by the addition thereto, as specified below, of suitable amounts of astigmatic correction."

The added astigmatic correction would obviously be as "constant" as possible over substantially the entire area of the lens surface to which it is added, in order to provide a uniform sight correction.

The fact that the independent "constant" astigmatism of each of Jeffree's two "aspherical" surfaces, like Bach's, is cancelled out in the lens as a whole, so that the lens may be used "without further modification" for the purpose of compensating for farsightedness (presbyopia) alone is shown in the following excerpt:

> "A lens so designed may be used without further modification when no corrections for visual astigmatism are required to be incorporated; as previously explained, when such corrections are required they are added to one or other surface of such a lens."

Jeffree states that "lenses according to this invention . . . may also be made by grinding and machining processes of known type, in glass, plastics or other (transparent refringent) materials." One final pertinent teaching in the Jeffree patent is as follows:

> "In certain cases lenses incorporating astigmatic correction can be made according to this invention with the same surfaces of revolution . . . as are appropriate for lenses with no astigmatic corrections, by slight displacements of one . . . surface relative to the other."

Upon review of all the evidence in this case, the Court finds that the differences between the subject matter of Claims 1, 2, 5-10, 12 and 13 of the Bach application in suit and the prior art, particularly the Jeffree French patent, are such that the claimed subject matter as a whole would have been obvious at the time the Bach invention was made, October 6, 1956, to a person having ordinary skill in the art of making optical lenses. Therefore, the Court holds that the claimed subject matter of the application in suit is unpatentable under 35 U.S.C. § 103.

In addition to the rejection for obviousness under 35 U.S.C. § 103, the Bach application in suit was also rejected on two other grounds, namely, insufficiency of specification disclosures and indefiniteness of the claims, both rejections being based on 35 U.S.C. § 112. Initially, the Court states the rule that "the words of a patent or a patent specification, like the words of specific claims therein, always raise a question of law for the Court and may not be determined by the opinion of experts." *Watson, Commissioner of Patents* v. *Bersworth et al.,* 102 U. S. App. D. C. 187, 251 F. 2d 898, 116 USPQ 79 (D. C. Cir. 1958). With particular regard to the facts of this case, where there is a clear conflict in the evidence, this rule means that the Court must independently determine the questions of sufficiency of disclosure and definiteness of claims, and the Court is not bound in any respect either by the opinions of plaintiff's experts, who were qualified to testify at the trial as "persons skilled in the art," or by the opinions of defendant's experts, namely, the Patent Office Examiner who handled the Bach application and the Board of Appeals.

Determination of the issues of sufficiency and definiteness should not be conducted in a vacuum, however, for such abstract determinations without regard to fact situations are easily foreseen to be the precursors of arbitrary, fanciful rejections based on 35 U.S.C. § 112. One factor which should be taken into consideration in determining sufficiency is the state of the particular art. When the prior art patents are characterized by a general vagueness and incompleteness of disclosure, as are the three prior art patents cited as references against the Bach application in suit, the Patent Office does not place itself in a favorable position to challenge the completeness of a patent specification in the same art. While defendant takes the admittedly correct position that previous errors of the Patent Office in granting patents with vague, even incomprehensible, disclosures do not justify continuation of such errors, nevertheless there is at least an equally plausible inference (and even a presumption under 35 U.S.C. § 282) to the effect that the prior art patents were correctly granted by the Patent Office, which now attempts to apply unduly harsh standards in rejecting patent applications which are currently being examined, on the ground of insufficiency of specification disclosures.

While the general vagueness of prior art patents in a particular art cannot, of course, relieve an applicant from the statutory obligation of drafting his specification and claims so as to comply with 35 U.S.C. § 112, the Court is of the opinion that it is a factor which may properly be considered, so that maximum latitude should be accorded an applicant in determining whether his specification disclosures for an invention in the same art are sufficient to comply with the statutory requirements.

Another equitable consideration which the Court believes is proper to take into account in this civil action under 35 U.S.C. § 145, formerly a bill in equity under R. S. 4915, is the fact that the plaintiff's application in suit is a translation and modification of the original that was filed in the French Patent Office, which does not examine for novelty so that specific claims to the invention are unnecessary, only a resume being required in lieu of claims in France.

While a foreign inventor's United States patent application must comply with the requirements of 35 U.S.C. § 112, the Court is of the opinion that the liberal spirit of the International Convention for the Protection of Industrial Property, to which France and the United States are parties, requires that maximum latitude be accorded in determining the issue of whether French inventor Guy

Bach's application in suit complies with the statutory requirements of Section 112.

In view of the aforementioned considerations, plus the trial testimony of plaintiff's witnesses, the Court holds that the specification disclosures of the Bach application are sufficient to comply with the requirements of the first paragraph of 35 U.S.C. § 112. Likewise, the Court holds that the claims of the application in suit particularly point out and distinctly claim the subject matter which applicant Bach regards as his invention.

With particular regard to the claims, the expression "constant astigmatism" may reasonably be interpreted (on the facts of this case) in light of the specification to mean *substantially* constant astigmatism, since the word "substantially" occurs several times in the specification. The claims of a patent application should always be interpreted in light of the specification, since an applicant may be his own lexicographer.

The objection by defendant that the structure of the first face surface of revolution which has the "constant astigmatism" is not distinctly defined in the claims is not well taken. The surface of revolution is by definition formed by revolving a defined curved line, namely "a meridian whose curvature varies in a continuous manner," about a straight line axis of revolution. If anything is missing from the claims in this regard, it is only the Cartesian coordinates which locate the axis in relation to the curved meridian. Two means for locating this axis are shown in the Bach specification, and it would be particularly inappropriate to clutter the claims with such coordinates which, if present, would only be regarded by the Court as window dressing without patentable significance.

In summary, the Court holds that the specification and claims of the Bach application in suit comply with the requirements of 35 U.S.C. § 112, but the claimed subject matter is obvious and unpatentable under 35 U.S.C. § 103. Therefore, plaintiff's Complaint should be dismissed.

This Opinion contains Findings of Fact and Conclusions of Law.

Dated: February 16, 1966.

JOSEPH R. JACKSON,
United States District Judge.

Order Dismissing the Complaint.

This civil action under 35 U.S.C. § 145 came on to be heard at the last term, and thereupon upon consideration of the full record and briefs therein, it is this 16th day of February, 1966

ORDERED, that the Complaint be, and it is hereby dismissed, with costs against plaintiff.

JOSEPH R. JACKSON,
United States District Judge.

Plaintiff's Motion Under Rule 52(b) for Findings of Fact and Conclusions of Law and for Findings and Conclusions Additional to Those Already Requested; and Under Other Rules for Reversal of the Judgment.

Now comes the plaintiff by counsel and moves as follows:

1. That the Honorable Court make distinct findings of fact.

2. That the Honorable Court adopt the following findings of fact as proposed by plaintiff, as plaintiff deems such essential to a proper consideration of the case:

Page 2, paragraphs A, B, C and last paragraph.

Page 3, the first and second paragraphs.
Paragraph 5. Paragraph 6.

Page 4, Paragraph 8.
Paragraph 9.
Paragraph 10.

Page 5, Paragraph 12.

Plaintiff also moves that the following findings of fact and conclusions of law be adopted:

First: The foreign reference Jeffree states that the surface shapes of his lens are determined arbitrarily or from experience, (English specification, page 2, lines 25-30; Column 2, lines 94 to 194; lines 113 to 120), and that such requirements are inconsistent with the requirements of adequate disclosure, and that such reliance upon the skill of the artisan as distinguished from a disclosure of invention does not constitute anticipation of the present case.

Second: The foreign reference Jeffree is incomprehensible at a critical point of its disclosure, as testified by the witnesses, and is not a valid reference.

Third: The method by which Evans constructs his lens is basically different from that by which appellant constructs his lens.

Fourth: The method by which Poullain constructs his lens is basically different from that by which appellant constructs his lens.

Fifth: The methods of Poullain and Evans are basically different from the method of Jeffree, are inconsistent with each other, and the patents are not combinable.

Sixth: The mathematical systems of Evans and Poullain, by which their lenses are derived, are not the mathematical system of Jeffree and are not the mathematical system of appellant.

Seventh: The mathematical systems of appellant, by which his lens is derived, are not anticipated; and are unique.

Eighth: The decision of the Court combined uncombinable references on the basis of statements selected from them without regard to the unrelated nature of the systems themselves. It would require invention to combine the teachings of the references.

February 24, 1966.

John L. Seymour,
Attorney for Plaintiff.

Bauer and Seymour,
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New York, N. Y. 10020.

Plaintiff's Motion for Reconsideration and Rehearing.

Now comes the appellant by counsel and moves for reconsideration and rehearing:

I. The opinion of the court contains factual misapprehension at a critical point. On page 5, at line 8, the opinion confuses the astigmatic correction for defect of sight with the novel principle of constant astigmatism of the front face of the lens.

These are two things, not the same thing. The same error was made below and it is not in any critical spirit that this motion is brought. The subject is intricate to the point that even skilled persons have difficulty with it, yet the difference is clear, has been carefully explained in the record, and is stated in the basic claim.

It is to be observed that correction of astigmatic error would apply only to the subordinate claims, not to basic claim 1. Claim 1 deals with the lens in its pure form, unmodified to provide correction for imperfection in the eye. This recital in the basic claim establishes a clear distinction, because it states: "* * * said first face having a constant astigmatism * * *".

II. Another point of error is formed at midpage 4, where the opinion reads:

> "* * * it should be possible to achieve the (a) *desired result* of substantially constant astigmatism (b) in a panfocal lens."

> (a). Nowhere do the references state that such a result is desired. The very concept is lacking.
>
> (b). Neither does the invention or its claim require constant astigmatism of the lens, but only constant astigmatism of the *front face* of the lens.

With these two errors, each critical, the appellant respectfully moves for a rehearing, and for reversal of the judgment. It is not believed that the Honorable Court will wish its decision to rest on an error of comprehension, however intricate the subject.

February 28, 1966.

John L. Seymour,
Attorney for Plaintiff.

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30 Rockefeller Plaza,
New York, N. Y. 10020.

Defendant's Motion for Amendment of Findings Under Rule 52(b).

The defendant in accordance with the provisions of Rule 52(b) of the Rules of Civil Procedure moves that the Opinion of the Court filed February 16, 1966, be amended to delete or to modify the two paragraphs reading as follows:

> "Another equitable consideration which the Court believes is proper to take into account in this civil action under 35 U.S.C. § 145, formerly a bill in equity under R.S. 4915, is the fact that the plaintiff's application in suit is a translation and modification of the original that was filed in the French Patent Office, which does not examine for novelty so that specific claims to the invention are unnecessary, only a resume being required in lieu of claims in France.
>
> "While a foreign inventor's United States patent application must comply with the requirements of 35 U.S.C. § 112, the Court is of the opinion that the liberal spirit of the International Convention for the Protection of Industrial Property, to which France and the United States are parties, requires that reasonable maximum latitude be accorded in determining the issue of whether French inventor Guy Bach's application in suit complies with the statutory requirements of Section 112."

Justification is believed to be lacking either in the Convention of Paris For The Protection Of Industrial Property or in any known United States law or decision for the conclusion that the "liberal spirit" of the Convention "requires that maximum latitude be accorded in determining the issue of whether French inventor Guy Bach's application in suit complies with the statutory requirements of Section 112".

Defendant's Motion for Amendment of Findings Under Rule 52(b).

The only part of the Convention, as revised by the Act of Lisbon, 1958, of possible pertinence is Article 2, paragraph (1), which reads:

> "(1) Nationals of each of the countries of the Union shall, as regards the protection of industrial property, enjoy in all the other countries of the Union the advantages that their respective laws now grant, or may hereafter grant, to nationals, without prejudice to the rights specially provided by the present convention. Consequently, they shall have the same protection as the latter, and the same legal remedy against any infringement of their rights, provided they observe the conditions and formalities imposed upon nationals."

Nationals of countries other than the United States, in accordance with that paragraph, are to enjoy in the United States the advantages that United States laws now grant, or may hereafter grant, to United States nationals. There is no suggestion that they are to be granted anything more than equal treatment with United States nationals, such as the "maximum latitude" in the interpretation of United States statutes.

The statement that the "maximum latitude" in determining compliance with 35 U.S.C. 112 should be accorded an application which is a translation and modification of an original application filed in the French Patent Office, would seem to imply that in other circumstances less than "maximum latitude" would apply. Logically, it could not, it is submitted, have been the intent that the United States, in ratifying the Convention, agreed that a more liberal standard of sufficiency of disclosures under Section 112 would be applied to foreign originating disclosures than to those originating in the United States, thereby discriminating against its own citizens. If any reassurance were needed on the point, it is supplied by the legislative history of Congressional action in connection with the Convention. An Act of Congress of June 4, 1898 (30 Stat. 431) provided for the appointment of three Commissioners to revise and amend the patent and trademark laws in relation to the Convention. The report made by the Commissioners on November 27, 1900, made the following statement about the Convention (which included at the time an Article 2 similar in substance to the corresponding Article quoted hereinbefore):

> "The sufficiency of the disclosure and the novelty and patentability of the invention as found in the foreign application must be decided in accordance with existing laws, *precisely as in a case of a like application filed by a citizen of the United States.*" (Emphasis added.)

Further, to accord disclosures originating abroad any more "latitude" than those originating in the United States would go contrary to the rationale of *In re Smyth,* 38 CCPA 1130, 189 F. 2d 982. In that case, the United States Court of Customs and Patent Appeals held as to the sufficiency of a British provisional specification to entitle a corresponding United States application to the date thereof, "* * * the procedure here is governed by United States law." The Court quoted with apparent approval a statement by the examiner that:

> "A foreign specification whose text is to serve as the basis for claims in an American patent must conform to the requirements of Revised Statute, Sec. 4888, as rigidly as an American specification."

Further, these holdings are unnecessary to the conclusions reached by the Court on the issues presented. Having decided that prior disclosures are properly a factor to be considered in determining whether a later specification is sufficient to meet the requirements of the statute, these paragraphs are in effect, obiter dictum.

For the stated reasons, it is believed that deletion of the noted paragraphs is in order.

Respectfully submitted,

Joseph Schimmel,
Acting Solicitor,
U. S. Patent Office,
Attorney for Defendant.

March 1, 1966

I hereby certify that two copies of the foregoing Motion for Amendment of Findings under Rule 52(b) were mailed today to the plaintiff's attorney, N. D. Parker, Jr., 1518 K Street, N. W., Washington, D. C.

Joseph Schimmel,
Acting Solicitor.

Excerpts From Transcript of Proceedings Before District Court on March 18, 1966.

(6) Mr. Seymour: I think that we have a case of manifest error, and I think that I can show Your Honor where that manifest error arose.

Now, the first thing that I have to do is to read the first claim to Your Honor, which is the basic claim; and then I will read the others and point out where I think the error arose.

On page 4 of the record from the Patent Office I (7) find this claim [reading]:

"A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface."

Now, if I take my glasses here [demonstrating with his own eyeglasses] the outer face is the first main face.

The Court: How is this lens to be used, in these glasses?

Mr. Seymour: Yes, in eyeglasses.

The Court: They have been selling them for years.

Mr. Seymour: Oh, no, Your Honor.

The Court: They have been selling a glass without a change, a double glass without any sign of a change in here.

Mr. Seymour: That is simply a bifocal lens, which has been ground out of one piece of glass instead of being assembled from two pieces of glass.

This is a lens in which there is a continuous variation from very far, from the vision at a far distance at the top graduated down to close position at the bottom; a complete and perfect graduation of vision.

(8) The Court: How does your lens differ from that? You get the same thing, don't you, in the end?

Excerpts From Transcript of Proceedings Before District Court on March 18, 1966.

Mr. Seymour: No, Your Honor. We have a progressive variation.

The Court: Isn't that progessive too that you are holding in your hand [indicating to Mr. Seymour's eyeglasses]?

Mr. Seymour: No, this is just one thing. No matter where you look through this you have only one degree of magnification and only one focal length.

The Court: I see.

Mr. Seymour: Whereas in the lens of—

The Court: I thought that was a dual—

Mr. Seymour: No, this is just a simple one. The thing I am illustrating here is that this is the first face of the lens.

The Court: Oh, yes, I understand that.

Mr. Seymour: Now, this says that the first face has a constant astigmatism in at least one region of substantial area of its surface. Now, this refers only to the very outer surface of the front face of the lens.

The Court: All right, I understand that. I understand the way it is made up. Now, proceed.

Mr. Seymour: Now, the 5th Claim reads this way:

"A lens as defined in the foregoing claims, wherein (9) the lens is adapted to correct astigmatism as well as farsightedness of the eye. And the second face of the lens is an astigmatic surface resulting from the composition of two component surfaces," etc.

If I may place it this way: Your Honor has passed only upon the astigmatic correction for the lens of the eye and has not passed at all upon this first claim, which contains this very novel combination of properties which are set forth here.

Now, if I may read for a moment from the testimony of Dr. Scholes, who was one of my two witnesses:

Excerpts From Transcript of Proceedings Before District Court on March 18, 1966.

[Reading from page 33 of transcript of proceedings at trial on March 1, 1965.]

"Q. Now, do I understand that what you have said just now is that the front face of the lens has a constant astigmatism in at least one region of substantial area of its surface? A. Yes, that is it. In fact, I should think that that constant astigmatism, very small, however, is over the entire front surface.

"Q. Have you read the three references which are in this case?

> "The Court: He probably had them read to him.
>
> Mr. Seymour: Yes, sir."
>
> Your Honor may remember that Dr. Scholes was almost blind.
>
> (10) The Court: Yes.
>
> Mr. Seymour [reading]:

"Q. Have you had the three references in this case, Evans, Jeffree and Poullain, read to you? A. I have.

"Q. Do any of those three references have a constant astigmatism in at least one region of substantial area of its front surface? A. None provide that constant astigmatism.

"Q. Without that constant astigmatism, can you make a lens both surfaces of which are surfaces of revolution; and I should say a panfocal lens, both lenses which are surfaces of revolution? A. Will you rephrase that question, please? I don't quite follow you.

"Q. All right. Is it necessary to have an outer surface provided with a face of constant astigmatism if you are to make the lens with an outer and an inner surface which are surfaces of revolution? So far as you know? A. So far as I know, the constant astigmatism results from a selection of dioptric power horizontally or, perhaps one should say the radii of curvature horizontally that can be provided with the least error. It seems that trying to make it as a surface of revolution and trying to get the same radii (11) of curvature at all points, both east and west and north and south, let's say, would run into a great deal of error."

Now, therefore, the testimony of Dr. Scholes was, that this principle which was discovered by our inventors that there is a constant astigmatism of the front surface is not found in any reference.

Your Honor has yourself done much to establish that rule of law which states, that if you have a claim, a combination claim, that you cannot select one element from the combination from one reference, another one from another reference and a third element from a third reference and combine them into an anticipation.

In this case we are in far better condition than that rule of law which would protect us because the element of this Claim 1 is totally unknown. So with our combination we have a novel principle which, as testified to by the witnesses, does not exist in any of the references. And that is that the front surface of this lens, the surface as it is made, has a constant astigmatism.

Now, we come to the point of your decision. And that is you were considering this astigmatism as being a correction of the errors of the lens in the human eye.

The Court: That is what I always thought it was.

Mr. Seymour: That is what you were talking about, (12) Your Honor. But in this first claim there is no such error to correct. We have a novel principle which makes a panfocal lens and it depends upon this novel principle.

* * * * * *

Order Denying Plaintiff's Motion for Findings of Fact and Conclusions and for Reconsideration and Rehearing.

This case came on to be heard at this term on motions by the plaintiff (1) under Rule 52(b) for distinct findings of fact and conclusions of law and for additional findings and conclusions and (2) for reconsideration and rehearing, and thereupon, upon consideration thereof, it is this day of March, 1966,

Ordered that the said motions be and they are hereby denied.

....
Judge

* * * * * *

Order Granting Defendant's Motion for Amendment of Findings.

This case came on to be heard at this term on motion by the defendant that the Opinion of the Court filed February 16, 1966, be amended to delete or to modify the two paragraphs reading as follows:

> "Another equitable consideration which the Court believes is proper to take into account in this civil action under 35 U.S.C. § 145, formerly a bill in equity under R.S. 4915, is the fact that the plaintiff's application in suit is a translation and modification of the original that was filed in the French Patent Office, which does not examine for novelty so that specific claims to the invention are unnecessary, only a resume being required in lieu of claims in France.
>
> "While a foreign inventor's United States patent application must comply with the requirements of 35 U.S.C. § 112, the Court is of the opinion that the liberal spirit of the International Convention for the Protection of Industrial Property, to which France and the United States are parties, requires that maximum latitude be accorded in determining the issue of whether French inventor Guy Bach's application in suit complies with the statutory requirements of Section 112."

and thereupon, upon consideration thereof, it is this day of March, 1966,

Ordered that the said motion be and it is hereby granted and that the two said paragraphs be and are hereby deleted from said Opinion.

....
Judge

Notice of Appeal.

Notice is hereby given this 13th day of May, 1966, that Plaintiff, Compagnie de Saint-Gobain, hereby appeals to the United States Court of Appeals for the District of Columbia from that portion of the judgment of this Court entered the 16th day of February, 1966 in favor of Edward J. Brenner, the Commissioner of Patents, against Compagnie de Saint-Gobain, holding the claims of the patent application in suit unpatentable under 35 U.S.C. Sec. 103.

Bauer and Seymour
Attorneys for
Compagnie de Saint-Gobain

Plaintiff-Appellant's Points on Appeal.

Plaintiff-appellant, Compagnie de Saint-Gobain, appealing to the United States Court of Appeals for the District of Columbia Circuit from that portion of the judgment of the District Court entered the 16th day of February 1966, which is in favor of the defendant, states as follows its points on appeal:

1. The judgment is contrary to the evidence and to the weight of the evidence.

2. The court failed to comprehend the subject matter of the invention and of the references cited against it and erred in fact.

3. The judgment is contrary to the law in such cases made, provided, and established.

4. The court erroneously applied the statute 35 U.S.C. 103 and erroneously interpreted it.

5. The court relied upon the unsworn, informal statement of a person or persons not before the court, and considered such matter in arriving at its decision, thereby denying the plaintiff the right of cross examination and the determination of truth.

6. No testimony was introduced to refute the testimony of the plaintiff's witnesses, which stood uncontroverted, yet was given no weight.

7. The court erred in failing to grant plaintiff's motion for reversal of judgment.

8. The court made findings of fact which were erroneous.

Plaintiff-Appellant's Points on Appeal.

9. The court erroneously failed to adopt finding of fact presented to the court by the plaintiff.

10. The system of the District Court for the District of Columbia is, in patent cases, inconsistent with sound judicial practice, contrary to the interests of the public, and prejudicial to those who are, in effect, appellants from decisions of the tribunals of the Patent Office.

Compagnie De Saint-Gobain

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CHAMBERS OF CHIEF JUDGE BAZELON

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②

SUPPLEMENTAL JOINT APPENDIX

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,255

COMPAGNIE DE SAINT-GOBAIN,
Plaintiff-Appellant,
v.
EDWARD J. BRENNER, Commissioner of Patents,
Defendant-Appellee.

ON APPEAL FROM A JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

United States Court of Appeals
for the District of Columbia Circuit

FILED NOV 18 1966

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NOTE

The portions of the record in this Supplement were inadvertently omitted by the printer from the Joint Appendix.

Excerpts From Transcript of Proceedings Before District Court on March 1, 1965.

(39) By Mr. Seymour:

Q. Now suppose, Dr. Scholes that you have an eye or somebody has an eye which has to have a correction for astigmatism. Now the question is this: To correct a defect of a given eye, must you have constant astigmatism of one lens surface in order to produce the lens by means of surfaces of revolution? A. I believe that Guy Bach's calculation and description demonstrates that point. Being unable to handle the mathematics at short range, I was not able to handle that as well as I might hope. But it is a fact, that in order to grind the rear surface in such a way to offset the existing astigmatism created by the front surface and bring in a new astigmatism of the total lens which should be opposite to that created by the eye in order to produce a correction, then it is necessary to have that constant astigmatism of the front surface or else the correction cannot be performed. That rear surface grinding, of course, has to be done by a toric grinding wheel, which I like to describe as a kind of a fat donut which has, of (40) course, a shorter radius over the rim of the wheel than the radius of the wheel itself. So that essentially the two cylinders are ground at once, front and back, and their axes are at right angles to each other, and then we have a surface corresponding negatively to that positively toric surface that I described somewhat earlier on the outer surface of the lens.

Q. Have you had the references read to you? A. Do you refer to—

The Court: He stated before that he had the references read to him.

By Mr. Seymour:

Q. Was the Poullain patent reference clear? A. Not entirely.

Q. You found that it was not clear in parts? A. Yes.

Q. Was the reference to Jeffree clear? A. No, it was not. The same remark applies. It was not entirely clear that there was—no specific description—a front surface that was anything like one of constant astigmatism.

Q. Did he describe it as being of constant astigmatism? A. He did not.

Q. Do you remember the Evans reference well enough to (41) state whether or not it was clear? A. I remember it just well enough to say that I did not understand it well.

Q. Compare the description of the Bach lens with the descriptions given by Evans, Poullain and Jeffree and tell me which was the clearer description? A. The Bach description was, by all odds, the clearest of the four.

Q. Now I am going to take the claims and read them to you, Dr. Scholes, and I am going to ask you to comment on those things which you consider to be new with Bach.

"Claim 1. A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface."

What are the novel features of this claim which distinguishes it from the three references? A. In particular it is the claim of constant astigmatism on that front surface.

Q. Now we will take claim 2.

"Claim 2. A lens as defined in claim 1 wherein the (42) first face is of such configuration that at all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridian and in a plane containing the radius

R and lying perpendicular to the meridian plane are different, and substantially satisfy the equation:

$$“\frac{n-1}{R} - \frac{n-1}{R'} = \text{a constant, K,}$$

“K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters.”

Do you understand that claim? A. Yes.

Q. What does that claim add to claim 1 which is novel with respect to the three references which are cited? A. As I see it, it reduces it to essential mathematics of that surface and demonstrates how that astigmatism is calculated and generated by the proper choice of those radii R and R′.

Q. (Reading) “Claim 5. A lens as defined in claim 2 wherein the lens is adapted to correct astigmatism as well as farsightedness of the eye, and the second face of the lens is an astigmatic surface resulting from the composition of two component surfaces, one of said two component surfaces having an astigmatism equal to —K, and the other of said two (43) component surfaces having an astigmatism equal to and opposite from that of the eye to be corrected.”

Do you understand that? A. Yes.

Q. And what it adds to claims 1 and 2? A. Yes, it adds the configuration of the rear surface, which must cancel out the astigmatism of the front surface and offer new astigmatism opposite to that of the eye to be corrected.

Q. Now do any of the three references describe the subject matter of claim 2? Do you understand claim 2 includes everything which is in claim 1? A. Yes.

Q. And adds to it.

Now you have already testified that they do not disclose what is in claim 1, did you not? A. None of the others attempt to show that mathematical relationship or even specify that that kind of correction can be definitely calculated and made.

Q. Now taking claim 5, wherein the lens is adapted to correct astigmatism as well as farsightedness. Do any of the three references include the subject matter of claim 5? A. No. I believe I covered that by mistake, perhaps, in my previous answer. They do not.

(44) Q. Now Claim 6 adds to Claim 5, which is based on Claim 2 and is based on Claim 1: "A lens as defined in claim 5 wherein the second lens face has a meridian which has a constant radius of curvature." Is this also new compared to the references? A. Will you repeat that, please?

Q. (Reading) "A lens as defined in claim 5 wherein the second lens face has a meridian which has a constant radius of curvature." A. That represents exactly what I found upon examining the specimen of the Bach lens, that that inner face had a constant radius of curvature, that is measured as diopters of power.

Q. Then you will testify that the specimen which is before the Court is a lens conforming to the Bach formula? A. Yes.

Q. Now Claim 7 adds something to Claims 1 and 2. Now Claim 1, you will remember, was the general principle. Claim 2 added the mathematical formula to it. Claim 7 reads:

> "A lens as defined in claim 2 wherein the first main face of the lens is developed by rotation of a curved meridian around an axis, the radius of curvature of the meridian being variable, the meridian being composed of a plurality of arcuate segments, the normals to the arcs at (45) their meeting points being coincident."

Is there any such description in any of the references? A. I did not hear it. I did not hear such a description in the references.

Q. Claim 8 is based upon Claim 7 and it says:

> "A lens as defined in claim 7 wherein the arcuate segments are involutes of circles."

Does that claim also add something new to Claim 7 which is not shown in the references? A. Yes, it does.

Q. Claim 9 now goes back to Claim 5, and Claim 5, if you will remember, added the correction for astigmatism, as well as farsightedness, to Claims 2 and 1. Claim 9 reads as follows:

> "A lens as defined in claim 5 wherein the first main face of the lens is developed by rotation of a curved meridian around an axis, the radius of curvature of the meridian being variable, the meridian being composed of a plurality of arcuate segments, the normals to the arcs at their meeting points being coincident."

Does this also add an additional increment of novelty which is not shown in the references? A. I think it does.

(46) Q. Now the next claim is dependent upon the one which we have just considered. It reads:

> "A lens as defined in claim 9 wherein the arcuate segments are involutes of circles."

Is this also novel beyond the references? A. As I recall the references, they did not specify what kind of a curve along the meridian was going to be developed.

Q. Now Claim 12 reads as follows:

> "A panfocal lens made of transparent refringent material having an index of refraction *n*, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in

> at least one region of substantial area of its surface, said second face having a constant astigmatism in at least one region of substantial area of its surface which confronts and is aligned with said one region of the first face."

Do you understand the claim? A. Yes. And that claim matches up exactly with the measurements that I made on the inner face of the specimen, that is to say, the inner face had a 3° astigmatism opposite to that of, or negative to that, I should say, of the front (47) face.

Q. Do any of the references describe such a lens? A. I did not hear it.

Q. Now Claim 13 is based upon Claim 12, which I have just read to you, and it reads as follows:

> "A lens as defined in claim 12 wherein the first face is of such configuration that at all points in the region of constant astigmatism the radii R and R′ from a given point in such region and lying, respectively, in the plane of the meridian and in a plane containing the radius R and lying perpendicular to the meridian plane are different, and substantially satisfy the equation:
>
> $$``\frac{n-1}{R} - \frac{n-1}{R'} = \text{a constant, } K,$$
>
> "K equalling the astigmatism of the face at such point in diopters when R and R′ are measured in meters."

Do you understand that claim? A. Yes.

> The Court: I was wondering if you couldn't ask one question with respect to all those claims rather than go through every one of them with an answer yes or no.
>
> What does it mean? But you are trying your case your own way. Go ahead.

By Mr. Seymour:

Q. Does that claim also add an increment of novelty (48) to claim 12 which is not found in the three references? A. Yes.

Mr. Seymour: That is all on direct examination, your Honor.

The Court: Mr. Cochran, are you going to rely principally upon the fact that this is a question of law, the decision in this case, rather than the references?

Mr. Cochran: No, your Honor. I think they are all grounds of rejection that stand on a par and will all have to be considered separately. There are three different grounds.

The Court: I know there are. I have read it.

Mr. Cochran: I think they are all equally important.

The Court: I see. Go ahead.

I didn't think you were going to abandon any, but I asked you what you are going to rely on most, the legal point?

Mr. Cochran: I would say that the question of disclosure is fundamental in every case.

The Court: Of course it is. But that is a matter of law.

Mr. Cochran: And certainly it is of abiding importance here. I will put it that way. I wouldn't want to (49) say it was any more important than the Section 103 rejection.

The Court: I see. Go ahead.

Cross Examination by Mr. Cochran:

Q. Doctor, there is one technical aspect of this perhaps you can help me on. Astigmatism has been described to us as inability to focus on a point, or emphasis of certain lines, but at any rate the description has been in terms of a lens, has it not? A. Yes.

Q. Now at the same time there has been considerable discussion here of the astigmatism of a surface. Now what is that? A. There you would have to consider that the glass or other refringent material was of indefinite thickness and what happened to the light referred merely to its passage through that medium and not to what happened on the other side, the other side, of course, having a different kind of surface, curvature or flatness or what not, from the first surface. All that we can say there is, as we have described it in terms of diopters, the power of that outer surface waiting for whatever inner surface may be presented to it is properly described as being astigmatic, more powerful in one direction than in another at right (50) angles or another angle to it.

Q. Thank you, sir. That does clarify it. Now, what are the advantages, if any, of this constant astigmatism feature that is called for in the Bach claims? A. The advantages are that it can be corrected. If, for example, the patient for whom the spectacle lens is being prescribed has eyes with no astigmatism, we would want to correct merely that astigmatism already present in that front surface by producing its negative on the inner face; and then we should have overall stigmatic or, as one might prefer to say anastigmatic lens. Then too, when the lens must be ground to a prescription for some person with astigmatism at some angle other than the one presented by that original front surface, it can be corrected and rearranged into that new astigmatism of the whole lens to counteract that of the eye.

If the astigmatism was not constant over at least a considerable portion of the surface, you would correct only part of it and the rest would be vague or at some wrong angle.

Q. Well if you were designing a lens to correct an astigmatic condition in the eye, it would be an advantage, wouldn't it, to have constant astigmatic correction over the whole surface of the lens or a substantial portion of the (51) lens? A. Yes.

Q. And this is something that would be well recognized in the art, is it not? A. Yes.

Q. Now if you have decided—let's assume for a moment that you have decided on an appropriate curve for the meridian of a lens which is of progressively increasing curvature. And you are going to generate a surface with that meridian. And you swing the curve line trasversely of the lens so that its upper end swings on a radius substantially equal to a certain radius, and its lower end swings on a radius which is a different radius. And the radii are centered in fixed points. Would you have a surface of revolution?

Did you follow that, Doctor? I know it was a long question. A. I think I did. You are not swinging that curve around the point, you are swinging it around that axis. That axis does not need to be parallel to the principal axis of the lens.

Q. Right. A. And, therefore, you can have those radii of different lengths reaching to that axis at different positions.

(52) Q. Yes. Would you by carrying out this process have a surface of revolution? A. Yes. I have described that. We were talking just a moment ago about the geometry of the situation, which is something almost imaginary compared with the actual grinding of that surface, which I described in my previous testimony.

Q. Now you understood the conditions that I set up, and you say that if you do swing this curve around the axis, which is not parallel to the principal axis of the lens, you do have a surface of revolution? A. Geometrically, yes.

Mr. Seymour: Will counsel make a sketch?

Mr. Cochran: I am satisfied with what I have, your Honor.

The Court: Counsel may conduct his own cross examination. He is entitled to do that. If you want to get a sketch in conformity with this question you may take it up on redirect.

By Mr. Cochran:

Q. Now do you remember a table of dimensions that was given in the Bach specification? A. In a general way, yes, I do remember there was such.

(53) Q. I think it was given on page 5 of the specification. Yes, page 5 of the specification.

Now the first column, if you will remember, said "Power" and it had a list of numbers indicating the power on the meridian of the lens. And it had certain X and Y dimensions in millimeters. And it referred in the last column to the value of K.

Now that was not a complete definition of a lens, was it? Do you remember enough about it to say? I don't want to get into something you don't remember here. A. Well, is that the table in which Bach was showing how closely the astigmatic values were to each other and how small the error was?

Q. Yes. A. Yes.

Q. Now did that table, as you understand it, set up the axis around which the curve would be rotated to generate the lens? A. I can't say that it did.

Mr. Cochran: I think that is all I have, Your Honor.

The Court: Have you any redirect, Mr. Seymour?

Mr. Seymour: I think I may be able to get a little clarification on one point raised by Mr. Cochran, Your Honor.

Dr. Samuel R. Scholes—For Plaintiff—Re-direct.

(54) Re-direct Examination by Mr. Seymour:

Q. Is refraction the property of a surface or of a solid? A. It is the property of the solid itself. But, without going into it any further, it is also a property of the configuration of the surface itself.

Q. May I ask you to think for a moment of the diagrams which you will find in any physics book of a beam of light coming upon the surface of a prism. A. Yes.

Q. Now what happens to the beam of light at the surface? A. It is bent immediately upon entering the surface.

Q. So that the refraction occurs at the surface. And what happens to the beam of light after it is into the material of the prism? A. It goes in another straight line as long as it is passing through the same material.

Q. What happens when it strikes the other surface of the prism? A. It is refracted again according to the laws of refraction in one direction or the other.

* * * * * *

(58) Q. That is correct. But in each instance the light beam will be refracted at the surface, will it not? A. Yes. And this might help us, perhaps. You could consider that we are looking at a plane tangent to the surface at the point where the light strikes, and that will relieve us from thinking of the thing merely as a curve. As far as that point is concerned, it is a tangent at which the light strikes and is bent.

Q. Then may we say that refraction is the property of a surface existing between media of different kinds? A. That is all right.

* * * * * *

Excerpts From Transcript of Proceeding Before District Court on March 18, 1965.

(19) Mr. Seymour: I never like to go to the Court of Appeals when there is an obvious error right here.

The Court: If you have an obvious error and I refuse to correct it, what do you do then, take an appeal?

Mr. Seymour: I would prefer to have Your Honor correct your own error.

The Court: I know you would, but I can't follow you at all.

Mr. Seymour: I may say that Mr. Cochran, who I believe wrote the answer to this motion, has given you no support. Your position is not supported by Mr. Cochran. Mr. Cochran has talked about Claim 5—

The Court: Mr. Cochran agrees with you, does he?

Mr. Seymour: He does not say, I agree with you, Mr. Seymour, but he does not deny one single thing which I have told you. What he does is discuss Claim 5 and say that this astigmatic correction of the defect in the eye, that you can be (20) sustained on that. But he does not anywhere deny the accuracy of what I put before you this morning and what I put into my motion. That leaves Your Honor without any support from the defendant.

The Court: My own notion is good support to me.

Mr. Seymour: I have requested that Your Honor make more specific findings of fact along the lines of those which I requested in the first place. I think that they will point up the matter for Your Honor so that you will understand it better and, if I have to go on appeal, which I hope I will not, I think it will also make it a much more comprehensible case to the Court of Appeals.

Thank you.

The Court: Mr. Cochran.

Mr. Cochran: If Your Honor please, I suggest that both your decision and our response to Mr. Seymour's motion are sufficient to dispose of any argument he has presented here. What he has given you is a rehash of the argument that he gave you in his brief after trial.

The Court properly held, on the basis here of the whole record rather than the testimony of one witness, the references refuted the testimony of Dr. Scholes on that one point, as to the introduction of constant astigmatism into the surfaces of the lens. The Court pointed this out in its (21) decision. The decision is fully supported by the record.

* * * * * *

CHAMBERS OF CHIEF JUDGE BAZELON

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BRIEF FOR APPELLANT

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,255

COMPAGNIE DE SAINT-GOBAIN,
Appellant,

v.

EDWARD J. BRENNER, Commissioner of Patents,
Appellee.

AN APPEAL FROM A JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

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United States Court of Appeals
for the District of Columbia Circuit

FILED OCT 28 1966

Nathan J. Paulson
CLERK

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Statement of Questions Presented

1. The fundamental question is whether under 35 U.S.C. 103 any combination of the three references fairly anticipates a panfocal lens made of transparent refringent materials having an index of refraction n, the lens having a first and a second main face, both such faces being surfaces of revolution, the first face having a meridian whose curvature varies in a continuous manner, said first face having a constant astigmatism in at least one region of substantial area of its surface.

A subsidiary question is whether the court failed to decide this question.

2. Another question is whether the court may disregard the unrebutted testimony of witnesses who were duly qualified as skilled in the art, and who testified for the plaintiff-appellant.

3. Another question is whether the court erred in accepting the unsworn statements of a person not before the court, who had not been qualified as skilled in the art, whose qualifications, whether as skilled or as expert, are unknown, who had not been qualified to give opinion, skilled, or expert testimony, and who could not be subjected to cross examination.

4. Another question is whether the decision is contrary to the evidence.

5. Another question is whether the court fairly complied with Rule 52, which requires findings of fact and conclusions of law, and erred in refusing to adopt those presented to it.

6. Another question is whether the District Court for the District of Columbia has set up a specialist court for patents contrary to sound judicial practice.

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

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BRIEF FOR APPELLANT

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Jurisdictional Statement

The jurisdiction of the court below to entertain the case is within the conscience of that court; appellant has no knowledge of it.

The trial was held by a judge not a regular member of that court. Whether jurisdiction was properly his would depend upon facts outside the knowledge of the appellant and upon circumstances over which the appellant has no control.

Counsel for appellant disapproves the system as prejudicial to the rights of plaintiffs.

The plaintiff brought the case before the United States District Court for the District of Columbia from the Patent Office under 35 U.S.C. 145 and perfected its appeal to the Appellate Court under the proper sections of 28 U.S.C. viz 2107 and 1291.

Statement of the Case

There is no super highway to the comprehension of optics. It is comprehended by extensive study and diligent effort.

There is no royal road to the comprehension of optics but one fact will aid this court immeasurably; Lenses work by refraction of light; refraction of light is a surface phenomenon. It does not occur within a medium, it occurs on the surface. When light strikes the surface of a pond or of a lens obliquely it bends sharply and travels angularly through the water or glass in a straight line, angularly bending again at the surface when it passes out of glass into the air. When one speaks of the astigmatism of a lens, either of spectacles or of the eye, one is inherently speaking of aberrations of surface.

This case has been the victim of a series of errors: The Board of Appeals based its decision on a point which the Examiner had stated was not in issue (JA21a ll, 1-8); the District Court did not decide the basic question presented in claim 1 but became lost in the mazes of double-correction-by-compound-surfaces as expressed in claim 5; 35 U.S.C. 103 was the basis of rejection but not complied with; the testimony of plaintiff's skilled witnesses was ignored; and the opinion of the Examiner was relied on although being opinion, unsworn, and unqualified it was not properly before the court; the defendant's witness, the Examiner, was protected from cross examination.

The District Court fell into error by refusing to comprehend the existence of more than one problem in the optics of the eye (JA 91a I; 97a-100a) and the need for a specifically different solution for each specific problem.

The inventor, Guy Bach, proposed to make a spectacle lens on a new principle, but before we can understand the solution at which he arrived and the inventions which he made we must ourselves understand the problems which faced him:

The First Problem

The human eye is a complex organ having a lens and a projection screen called the retina. Light coming through the lens is supposed to be projected by the lens onto the retina; if it is properly focused by the lens the eye is stigmatic and if it is not the eye is astigmatic.

A perfect lens-of-the-eye may focus its entire beam perfectly on the retina, or it may focus its entire beam before or behind the retina. In the latter cases the eye is either farsighted or nearsighted. Focusing parallel to the retina but not on it is a defect within the term astigmatism. To correct this defect the oculist prescribes spectacles with lenses that makes the beam from the lens-of-the-eye focus on the retina. The common example of this is the simple spectacles which farsighted people use for reading.

The shape of the lens-of-the-eye is capable of being changed by muscles provided for the purpose so that the perfect, stigmatic eye can focus near or far automatically, without thought or effort, but when those muscles become weak, and when the lens becomes fixed at a focus which is too long for reading and too short for long-distance viewing, the practice has been to make bifocal spectacles with upper lenses which correct for nearsightedness and lower lenses which correct for farsightedness. Bifocal lenses are sometimes better than a single lens, but they cause shock at the line of transition where the two lenses abut; and they do not accommodate the eye to focuses of middle distance. To compensate for these imperfections trifocal lenses have been made in which the upper of three lenses compensates for nearsightedness, the middle lens compensates for middle distances, and the bottom for farsightedness. These lenses have been unpopular because the shock of transferring vision from far to near, or vice versa, has been accompanied by serious disturbances.

It has been proposed to make spectacle lenses of which the focus (power) changes gradually from the top to the bottom, so that, by looking through the tops the wearer would see clearly the distant mountains, and by slowly and regularly lowering his eyes would progressively sweep the intervening distances with vision perfectly progressing through shorter and shorter focuses, until, when his vision passed through the bottom of the lens, he could read the fine print in the book in his hand. This transition would be accomplished without shock, and would accommodate his vision to any selected distance. Such lenses may be called panfocal.

A major problem arose in the construction of such a lens because, while the power of the lens must increase progressively from top to bottom, the power of the lens on the horizontal, at any one level, must be substantially constant. That problem does not exist in simple spectacle lenses, which are all of one focus, but in panfocal lenses which are of infinitely varying focus, the problem was major and was not solved until the present inventor, Guy Bach, solved it.

The solution to the problem is the panfocal lens of claims 1, 2, 12, 13, 7, 8 of which claim 1 is fundamental.

The court did not consider or act on this claim, made no findings of fact with respect to it, and refused to adopt those findings, prepared by plaintiff, which pertained to it. When told of these errors the court chose to ignore the problem and the solution, and confused them with the second major problem, which is stated in claim 5 (JA97a-100a).

The Second Problem

We have been discussing perfect lenses-of-the-eye which cannot focus at certain distances, but which have no other fault. However, other aberrations occur in eye-lenses. For instance a lens may be astigmatic from a defect in shape. In such a case vision is distorted, objects appear to be of different intensity horizontally or vertically, or some parts of the lens focus on the retina and other parts do not. A simple example of such imperfection is revealed in viewing vertical and horizontal lines crossed at 90°, which may appear fainter vertically than horizontally, or may appear to be at an angle of 87°, not 90°. These types of astigmatism are specifically different from that of the First Problem. When an eye-lens must have compensation for the type of astigmatism of the Second Problem, further complexities are introduced into making panfocal lenses, which must then progress regularly in power from top to bottom, must be of approximately constant power at each horizontal level, and must also compensate for the additional aberrations of the eye.

The solution of this problem is found in the lens of claims 5, 6, 9, 10, of which claim 5 is fundamental.

The Third Problem

It is one thing to propose a panfocal lens, another to invent its form. It is conceivable that one could, with infinite patience and incredible labor make one by hand, as Jeffree proposed but such a lens would be imperfect and such methods would be useless to mankind. It would accommodate only one eye and to duplicate it would be folly as it would fit no other eye. Guy Bach conceived that, to be useful, the lenses must have both outer and inner faces which are surfaces of revolution. To have only one such face would be inadequate. A surface of revolution is one which can be turned out by rotary lens-grinding methods. Each face must receive its correct shape and the shapes must be imparted mechanically by machines which are of a type comprehensible to skilled workers and adaptable to mass production techniques.

Specifically, the formulas for the lenses must be such that the lenses can be turned out on rotary apparatus. That means that both the surfaces of the lens must be surfaces of revolution. Being surfaces of revolution, they can be turned out on such apparatus. Guy Bach's lenses have faces both of which are surfaces of revolution. This characteristic is another novelty of this invention. To make both faces of the lens as surfaces of revolution, while establishing constant power horizontally and constantly varying power vertically, was a problem wholly unsolved before Guy Bach solved it as described in the specification.

Traditional spectacle lenses have two faces both of which are surfaces of revolution but traditional lenses have only a single power and there is no problem in making them. The panfocal lens has power varying from top to bottom. This means that the meridian of the lens, the imaginary vertical line bisecting its front face, departs with regular progression from a circle. To make such as surfaces of revolution had been impossible.

Guy Bach's lens overcame this third problem by the mathematical methods (two of them) set forth in the specification (JA 6a, 9a) and incorporated in claims 2, 5, 13 (JA 16a).

The basic problem for this court is whether it constitutes invention to solve the three foregoing problems, considering not only each problem in itself, but considering the difficulty of solving the threefold problem posed by the combination of three such problems.

The novelty of claim 1 includes a panfocal lens of given index of refraction, each face of which is a surface of revolution (novel in a panfocal lens); the first face (the outer in spectacles), having continuously varying curvature (novel when combined with a surface of revolution); and having constant astigmatism in at least one substantial area of its surface (totally new concept. Novel alone; novel in combination with the varying meridian; and novel with two surfaces of revolution in a lens of varying meridian).

It must be noted that the constant astigmatism of the claim is the astigmatism of the front face of the panfocal lens, having no relation to the astigmatism of the lens-of-the-eye. The astigmatism of the lens of the eye is corrected by the panfocal lens as a whole.

Claim 2 adds to claim 1 the mathematical definition of the configuration of the outer (first) face of the lens.

Claim 5 adds to claim 2 and claim 1 the compensation for additional astigmatic aberrations of the lens of the eye.

In lenses of fixed focus type the method of compensation is simple, but Guy Bach's lens is so different from those of the prior art that traditional compensations do not apply. In the prior art you grind the rear face with a correction equal and opposite to the aberration of the lens-of-the-eye. In Guy Bach's invention the aberrations other than farsightedness or nearsightedness must be compensated otherwise: The second (inner) face of the lens is a combination of two component surfaces, one of which is the negative of $\frac{n-1}{R} - \frac{n-1}{R'}$ and the other of which is the negative of the aberration of the eye. (For significance of the formula see the specification.)

To pretend that such a concept is within the powers of a workman skilled in the art flies in the face of right reason, yet it is this very pretense that led to the rejection of claim 5.

We now request that the honorable Court of Appeals read the specification (JA 3a-13a) because no equal statement of the invention has ever been composed.

The References

The references do not anticipate any claim and it is not pretended that they do. There is no rejection under 35 U.S.C. 102.

Poullain, et al.—U. S. Patent No. 1,143,316.

Evans—U. S. Patent No. 2,109,474.

Jeffree—French Patent No. 1,112,429; British Patent No. 775,007 (used as a translation).

Certain Legal Problems and the Judicial System

The rejection is based on 35 U.S.C. 103 under pretension of obviousness.

The nature of what must be done by the Patent Office to sustain a rejection under 35 U.S.C. 103 was recently set forth by the United States Supreme Court in the case of *Graham, et al.* v. *John Deere Company of Kansas City, et al.; Calmar, Inc.* v. *Cook Chemical Company; Colgate-Palmolive Company* v. *Cook Chemical Company,* 148 U.S.P.Q. 459:

> ". . . under section 103, scope and content of prior art are to be determined, differences between prior art and claims are to be ascertained, and level of ordinary skill in the pertinent art resolved; . . . such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to circumstances surrounding origin of subject matter sought to be patented; . . ."

It is clearly implied that one must understand the scope and content of the application before one can undertake the three labors required by that rule of law.

The defendant did not comply with those requirements.

The complex nature of optics does not readily assent to assertions of obviousness.

The defendant assumed that the opinion of an expert is the test of obviousness—its own expert, the Patent Examiner.

The defendant did not produce a person skilled in the art to testify as to obviousness. Obviousness is not to be assumed and is to be tested by others than experts.

The defendant did not produce any qualify the Patent Examiner either as expert or as skilled in the art. Had he been produced as expert his testimony could have been excluded as not conforming to the standard established by 35 U.S.C. 103. Had he been produced as skilled in the art he could have been cross examined as to qualification to give opinions, and as to substance. As no qualification was attempted his unsworn opinions do not satisfy the statute or the rules of evidence and were not properly before the court (JA 104a; Points on Appeal 4 and 5).

This court should know that there are three modifications of law being quietly promulgated by persons in the Patent Office:

Those persons seek to define the word "obvious" as knowledge of desirability; e.g., as artificial diamond is known to be desirable, they assert that it would be obvious to make it. We maintain that "obvious" means simplicity of accomplishment, not knowledge of desirability;

They also seek to establish the opinion of the Examiner as the standard of obviousness under 35 U.S.C. 103, but that is not the standard established by that law. Neither is it the standard established by the decision *Graham, et al.* v. *John Deere Co., et al.; Calmar, Inc.* v. *Cook Chemical Company;* and *Colgate-Palmolive Company* v. *Cook Chemical Company,* 148 U.S.P.Q. 459. The standard is of the person skilled in the art, not the opinion of an expert;

They also seek to lead this court into the error of holding, as implied the judge below (JA 98a and 100a), that the fall of a dependent claim destroys all the claims from which it depends, e.g., if a basic claim recites the manufacture of artificial diamond, and a dependent claim recites washing the new diamond, the destruction of the dependent claim would tumble the basic claim with it. It is not good to find such hidden doctrines creeping through the higher echelons of the Patent Office.

Neither is it good to find an established appellate system with a single "expert" judge into whose hands all appeals can be channeled, and whose decisions have been so adverse to inventors that no appellant can expect more than a 20% chance of victory.

We can imagine no system better calculated to give the Solicitors for the Commissioner an aura of invincibility, better calculated to change judicial decision into mere compliance with Patent Office wishes, and better qualified to inject a series of bad principles into the law.

The technique of the rejection under 35 U.S.C. 103 is this, according to the United States Supreme Court:

1. The measure of accomplishment must be assessed. That is, the invention must be weighed.

That was not done by the defendant at any stage of the proceedings; the approach was purely negative.

2. The references must be analyzed and the extent of their disclosure must be stated. Analysis must be as of the date of the references, not of the date of the application.

In our case the defendant attempted to do this but by posing its analysis as of the present day erred in attributing more to the references than they contain. The result was extension beyond their disclosures, inclusion of applicant's teachings by implying them into the references, a general aura of constructing something out of nothing, and analysis as of a date subsequent to the dates of the references.

3. The extent to which the references fail must be established.

This was never done, the assertions of the defendant being that the references are complete in their anticipatory disclosures. No admission of insufficient or inadequate disclosure is in the official documents.

4. Who is a man-skilled-in-the-art was not established. This might be a factory laborer, an artisan, a college professor of general knowledge, but not an expert. That was not done. Also, defendant and the court relied upon the mere opinion of a presumed expert, the Patent Examiner. We maintain that no expert can be used as a person skilled in the art. We maintain that the person selected as a standard must be a worker of ordinary skill, or a person of general knowledge, not an expert.

The subject being optics, which is highly technical, and optics being taught in the course of physics in colleges, the plaintiff selected two professors skilled in optics, who are not experts in designing or making lenses, as reasonably skilled persons, and presented their testimony. No objection was made by defendant. They stand qualified.

The defendant had a witness to present but did not present him. He worked about a mile from the courtroom, he was available, but was not brought in; his testimony was presented and relied on (JA 85a, ll. 14-24) but it was unsworn, and was opinion; he was not qualified as expert or in any other way, and the opportunity for cross examination was denied to the plaintiff.

5. The decision must rest on whether the skilled person who has been selected as a standard would have found the making of the invention to be obvious.

The appellant established a type of skilled person on whom to base its judgment. It established a fair standard. It relied on the testimony of these skilled men, and no objection was made to their qualifications. Their testimony was not heeded by the court.

The patent judge excused the Patent Office from compliance with the rules of evidence pertaining to qualifications of witnesses, to expert testimony, and to cross examination.

Before this patent judge the chances of prevailing are not believed to be better than one chance in five; the figures have been published.

The patent judge considered matters not properly presented to him in open court, with respect to which the complainant had no possibility of cross examination.

Appellants from the Patent Office no longer have the possibility of hearing before the C.C.P.A., or before a regular judge of the District Court, because the Patent Office can always channel any case before this, its own judge.

The question of establishing expert judges in different fields (e.g. crime, contract, tort, patents) has often been proposed and debated but has always been condemned as worse than the inefficiencies already in existence, but the Patent Office and the District Court, have now set up that fallacious principle to the disadvantage of legal propriety, technical progress, and the rights of inventors under the law.

This court should require that the many judges of the District Court sit on patent cases in rotation in accordance with sound judicial practice, and that the practice of assigning patent cases to a single judge be forthwith abandoned.

The Scope and Content of the Invention

Determination of the scope of the invention has been made by the plaintiff-appellant. That determination is found in claim 1 and in its dependent claims.

Determination of the scope of the references will now be undertaken:

In assessing the value of the references with respect to claim 1, the following must be kept in mind, as they constitute the basic features of the new lens. The other claims will be considered in their order:

A. The lens has a first main face which is a surface of revolution;

B. The first main face has a meridian whose curvature varies in a continuous manner;

C. The first main face has a constant astigmatism in at least one region of substantial area of its surface;

D. The second main face is also a surface of revolution.

The Scope and Content of the References

Poullain, et al., U. S. Patent No. 1,143,316, June 15, 1915

This old reference has this to say of itself:

> "In order to obtain the surfaces indicated above, the methods ordinarily employed by opticians for cutting spherical, cylindrical or toric lenses would not be suitable and that it would be necessary to have recourse to special machines."

This suggests that it does not have a surface of revolution as its main face, which is confirmed by Figs. 1-3, which reveal the principle of Poullain's invention. The line a b c d being the meridian, of constantly changing curvature, and the question being asked being: "How do you derive that curve?" The answer is: "By assembling points a′ b′ c′ d′ in a spiral and extending lines a-a′, b-b′, etc. to points at which they are perpendicular to the curve, each line being of different length, about which that particular part of the curve is formed."

There is no known way to make a surface of revolution from such a collection of radii. Each radius (a-a′, c-c′, etc.) (ad infinitim) is different from every other, each center of curvature (a′, b′, etc.) is in a different place. Each of the infinite series of radii would have to be swung about its own axis, and every horizontal line, from top to bottom of the lens, would be a circle of different radius from every other. That is impossible.

The concept of constant astigmatism is not found in the Poullain patent. Indeed, the concept of imparting astigmatism to the front face of the lens is lacking. It would have been thought wrong, at the times of the references, to introduce astigmatism as that would have blurred the lens and have made it useless to the wearer.

The infinite variety of curves suggested as loci for the centers of curvature (archimedean, logarhythmic, circular evolent spirals, etc.—p. 2, ll. 66-71) is the very antithesis of the mathematical formulas presented by the applicant (in claim 2, etc.) which enable one to impart constant astigmatism and form the face as a surface of revolution.

No person, skilled or unskilled, could derive a principle of constant astigmatism from the disclosure of Poullain.

The court below, of minimal knowledge in such matters, avoided the question, gave no decision on it, refused to adopt the findings of fact on the subject, and ignored the testimony of the witnesses:

Dr. Scholes' testimony (JA 61a):

Note: Dr. Scholes has impaired vision and had the patents read to him.

> "Q. Have you had the three references in this case, Evans, Jeffree and Poullain, read to you?
>
> "A. I have.
>
> "Q. Do any of those three references have a constant astigmatism in at least one region of substantial area of its front surface?
>
> "A. None provide that constant astigmatism.

"Q. Now suppose, Dr. Scholes that you have an eye or somebody has an eye which has to have a correction for astigmatism. Now the question is this: To correct a defect of a given eye, must you have constant astigmatism of one lens surface in order to produce the lens by means of surfaces of revolution?

"A. I believe that Guy Bach's calculation and description demonstrates that point. Being unable to handle the mathematics at short range, I was not able to handle that as well as I might hope. But it is a fact, that in order to grind the rear surface in such a way as to offset the existing astigmatism created by the front surface and bring in a new astigmatism of the total lens which should be opposite to that created by the eye in order to produce a correction, then it is necessary to have that constant astigmatism of the front surface or else the correction cannot be performed." * * *

"Q. Now I am going to take the claims and read them to you, Dr. Scholes, and I am going to ask you to comment on those things which you consider to be new with Bach.

" 'Claim 1. . . .'

"What are the novel features of this claim which distinguishes it from the three references?

"A. In particular it is the claim of constant astigmatism on that front surface.

"Q. Now we will take claim 2.

" 'Claim 2. . . .'

"Do you understand that claim?

"A. Yes.

"Q. What does that claim add to claim 1 which is novel with respect to the three references which are cited?

"A. As I see it, it reduces it to the essential mathematics of that surface and demonstrates how that astigmatism is calculated and generated by the proper choice of those radii R and R'.

"Q. (Reading) 'Claim 5. . . .'

"Do you understand that?

"A. Yes.

"Q. And what it adds to claims 1 and 2?

"A. Yes, it adds the configuration of the rear surface, which must cancel out the astigmatism of the front surface and offer new astigmatism opposite to that of the eye to be corrected.

"Q. Now Claim 12 reads as follows: '. . .'.

"Do you understand the claim?

"A. Yes. And that claim matches up exactly with the measurements that I made on the inner face of the specimen, that is to say, the inner face had a 3° astigmatism opposite to that of, or negative to that, I should say, of the front face.

"Q. Do any of the references describe such a lens?

"A. I did not hear it."

Testimony of Dr. Stull (JA 68a):

"Q. Will you take claim 1, for example, and compare it with the reference Poullain.

"A. The claim 1 of the Bach application and compare it with Poullain. The comparison involves distinctions. First of all, that both surfaces of this lens should be surfaces of revolution.

"Q. According to Bach?

"A. According to Bach; yes.

"And also that the first surface of the lens of Bach is specified as having a constant astigmatism.

"Q. Now what about Poullain?

"A. Poullain does not specify a first surface having a constant astigmatism. He also does not specify that he will use surfaces of revolution.

"Q. Now do you find in Poullain the mathematical description of the lens which is found in Bach's claim 2?

"A. No, I do not.

"The Court: Of course, we are not trying the patentability of Poullain or any of the references.

"Mr. Seymour: Well, what I am proving here, Your Honor, is that Poullain does not have the description of the Bach lens as cited in these claims. There is no anticipation.

"The Court: Did the Examiner say Poullain has?

"Mr. Seymour: Yes, sir. The Examiner says Poullain anticipates this case. . . .

"Q. Now would you look, please, at claim 5?

"A. Yes.

"Q. Does Poullain have the subject matter of claim 5?

"A. No, he does not.

"Q. Claim 6?

"A. Now let's see.

"Q. Now keep in mind that claim 6 has—

"A. No, he did not.

"Of course, it contains claim 5, which contains 2 which contains 1. Of course, the answer is still the same.

"Q. Claim 7, please?

"A. Again the answer is the same.

"Q. Claim 8?

"A. The same answer.

"Q. Can you give the same answer for all the claims with respect to the reference Poullain, Doctor?

"A. Yes."

Evans, U. S. Patent No. 2,109,474, March 1, 1938

The difficulty of the subject is indicated by the lapse of time between advances in the art. Poullain et al.—1915, Evans—1938, Jeffree—1955.

Evans proceeds on the same theories as Poullain (see Fig. 5) but includes changes in detail:

The outer face of Evans' lens is spherical, having a single radius R8. Consequently, although it is a surface of revolution it has no astigmatism.

The Bach lens is distinguished by a front face of constant astigmatism, and by having a surface of revolution despite that fact.

The Evans invention is defined in scope by claim 1 in which the nature of his varying face is defined: As having dioptic curvature which increases gradually from edge to edge, and in which "the curvature, at practically any point along any one of said concentric lines being substantially equal to the vertical curvature at said point." Hence, no astigmatism.

Again we note that deliberately to impart astigmatism to a lens would have been thought to be senseless prior to Bach, whether the lens be simple or panfocal. Introduce astigmatism of its own into a lens and you blur the sight of the eye that uses it.

The Evans lens has no astigmatism on any face. The Bach lens has constant astigmatism deliberately introduced for the purposes of the invention.

To speak in terms of the patent law, there is no anticipation by incompatible opposites.

Fig. 5 of Evans is like Fig. 1 of Poullain in that an infinite multitude of radii R1-R7, of unequal lengths, have their centers at different points on a circle (dot-dash line running past X Y). It is said that these differential radii are "centered on" these fixed points but what that means is unknown. A fixed point does not move. The surface of the lens is said to be "conceived of" as having been generated by swinging this curved line (the circle) transversely of the lens (p. 2 of the patent at l. 45) while the radii are centered in fixed points X Y. This is incredibly obscure.

It requires that radii be swung while remaining fixed. Quite impossible to accomplish in fact and incomprehensible in theory. It was only intended to be a way of looking at it, not a description of the Evans invention.

That is not a clear description of anything, not even of his non-astigmatic surface, and not of a surface of revolution.

About this reference the witness, Dr. Stull, testified:

> "Q. All right, let's go to the reference Evans, if you please. Now will you please tell the Court whether or not the reference Evans meets claim 1?
>
> "A. No, it does not.
>
> "Q. In what way does it fail?
>
> "A. Precisely the same, two ways. The Bach claim 1 specifies both surfaces being surfaces of revolution. Evans does not do this. Bach claim 1 claims constant astigmatism for the first face. Evans does not.
>
> "Q. Will you testify that none of the claims of the Bach case are anticipated by Evans?
>
> "A. Yes."

and Dr. Scholes:

> "Q. Do you remember the Evans reference well enough to state whether or not it was clear?
>
> "A. I remember it just well enough to say that I did not understand it well."

Jeffree, British Patent No. 775,007

Jeffree—page 2, line 10—"each surface being aspherical".

But in Poullain one is spherical, and in Evans one is spherical. These are opposite and cannot be combined. One can have one or the other but not both. One destroys the other. Hence the references are uncombinable.

At each point on Jeffree's surfaces (2) the horizontal curve is greater than the vertical (p. 2, l. 10). But by how much is not stated.

Both Jeffree's surfaces are asserted to be surfaces of revolution (p. 2, l. 52), but no method of making surfaces of revolution is given, as discovered by analysis of the formation of Jeffree's lens. According to Jeffree:

1. A lens blank is present, both surfaces are impliedly formed, but are not finished (p. 2, ll. 90-95).

2. A perpendicular is drawn from eye center to rear surface (p. 90, l. 95).

3. The horizontal curvature is determined arbitrarily (p. 90, l. 99).

4. The following statement of Jeffree is incomprehensible:

> "From the refractive index of the lens material and the said horizontal curvature the position of the virtual image of the eye centre as formed within the material by rays refracted at the surface in a horizontal plane through line 13 and rear point 14 is determined by known optical theory as point 16; this point is hereinafter called the virtual eye centre."

The formation of a virtual image of the eye centre within the lens material is nonsense, and the remainder of the paragraph is what the State Department calls gobbledegook.

5. The horizontal power of the front face is now determined (p. 90, l. 15) but how it is determined is not stated, a fatal omission.

6. A suitable inclination of front to rear surface is determined arbitrarily or from experience (p. 2, l. 117)

but how it is done or what the determination is, is not stated. As the blank already has an inherent inclination, the "determination" must involve a change or not, but neither is specified.

7. The vertical form and curvature of the front face is chosen (p. 2, l. 125), but how is not stated.

8. The description in the patent following the foregoing is incomprehensible from page 2 last line to page 3 line 42 of the patent. Among many incomprehensible things the point 11 is called a surface (p. 3 l. 41).

9. A long process of trial and error follows (p. 2 ll. 42-59).

1. The blank is then used to make lenses by molding p. 4, ll. 1-23).

Dr. Stull gave a minute analysis of the reasons why Jeffree does not have surfaces of revolution even when he asserts them. This material is too long to copy and reference is made to the questions on pages 70-74 of the Record.

To summarize the Jeffree patent, it makes proposals of what might be done, by trial and error methods, to make lenses by molding them, but does not state how it is to be done.

The witnesses gave the following testimony regarding Jeffree:

Dr. Stull:

> "Q. Now would you be good enough to take the Jeffree reference and tell us whether or not it is a complete and comprehensible description of an invention?
>
> "A. No. The crux of my answer is that Jeffree does not tell me—although he tells me some geometry to do in his specification—why he does it. And I simply,

therefore, cannot understand what it is that he is doing. * * *

"Q. Now let us take the Jeffree British patent at page 2 of the complete specification beginning at line 105 and going to line 41 on page 3. Is that subject matter a clear and comprehensible description of a lens or how to make it?

"A. My answer would have to be, no, that it isn't.

"This was, incidentally, the part of Jeffree that I was talking about when I said he tells me some geometry to do but he doesn't tell me why and I can't understand it.

"Q. Now does Jeffree tell one how he proposes to make a lens?

"A. How he proposes to make a lens?

"Q. To make one, yes. If I may refer to—

"A. Well, you are talking about making an object now?

"Q. Page 4 at the top, if you please.

"A. All right. Yes, he does tell me, in general, what method he has in mind. In the general case he is thinking of making a mold into which he can pour some transparent plastic which then when it comes out will be a lens.

"Q. Now one of the problems which we have discussed in connection with this invention concerns the making of corrections in lenses for astigmatism of the eye.

"A. Yes.

"Q. Can Jeffree make such corrections?

"A. He proposes to make such corrections in the cast plastic lenses that he talks about. The way in which he proposes to do this is to take the two surfaces which he discusses in the main part of his specification, the combination of which does not contain astigmatism, and then in order to correct for the astigmatism of the given eye to add mechanically to the model which he has made and from which subsequently his mold will be made a correction for astigmatism.

"Now he suggests as an example that this correction be made by producing what is essentially a cylindrical lens of some plastic material. He suggests gelantine. Which then will be cemented to the model which he has made using the curves covered in his main specification. From this then he will electroplate metal onto the model, and by techniques which are known he will make the two halves of a mold which will then serve as the mold for the lens that he will subsequently get."

Dr. Scholes:

"Q. Was the reference Jeffree clear?

"A. No, it was not. The same remark applies. It was not entirely clear that there was—no specific description—a front surface that was anything like one of constant astigmatism.

"Q. Did he describe it as being of constant astigmatism?

"A. He did not."

"Q. Now do any of the three references describe the subject matter of claim 2? Do you understand claim 2 includes everything which is in claim 1?

"A. Yes.

"Q. And adds to it.

"Now you have already testified that they do not disclose what is in claim 1, did you not?

"A. None of the others attempt to show that mathematical relationship or even specify that that kind of correction can be definitely calculated and made."

The present applicant is the only one who has mathematically provided the necessary relationship to make a successful panfocal lens, and he did it by the extremely novel concept of imparting astigmatism to the front face of the lens (a thought horrible to any lensmaker), canceling it out with equal and opposite astigmatism of the rear face, and thereby deriving surfaces of revolution.

Dr. Scholes also testified claim by claim to the effect that the requirements of claim 1, the basic claim, are not found in any reference, that each other claim adds an additional element of novelty to claim 1 or to the claims on which it is based, and that none of those additional elements of novelty is found in any reference.

(JA 63a et seq.)

The Rejection Under 35 U.S.C. 103

That rejection, the only one before this court, pretends to combine selected passages from the references, but as to that the witness, Dr. Stull, testified:

> "Q. Now, Dr. Stull, I believe you testified that you are familiar with the Evans and Poullain references?
>
> "A. Yes.
>
> "Q. Can you take anything out of Evans and add it to what is in Poullain and make a Bach lens?
>
> "A. No.
>
> "Q. Reversing it, could you take anything out of Poullain and add it to Evans and make a Bach lens?
>
> "A. Perhaps I can save time. I can't take anything out of any one of the three and add it to anything out of any other of the three and make a Bach lens.
>
> "Q. I think that is a very complete answer. Thank you. In what way are they all deficient, all these three references?
>
> "A. The two main ways, the ones that I said before, the absence of surfaces of revolution and the absence of the constant astigmatism."

To the testimony of the witnesses we can add the following material:

The references Poullain and Evans provide for a main lens face having no astigmatism. (Poullain claim 4, Evans claim 1.) This is the antithesis of our lens, in which constant astigmatism is deliberately introduced, making possible a surface of revolution in the face of a panfocal lens.

It would not be within the ability of a person of ordinary skill in the art to reverse the teaching of the reference to attain a result they did not know of or consider desirable.

If Jeffree be considered, there is a conflict which cannot be resolved, which arises from several sources: He mentions surfaces of revolution but describes no method of attaining them; his methods will not produce them (Dr. Stull); his methods are for manufacture by molding plastics, and totally inconsistent with the glass grinding methods of Poullain and Evans, making the combination of Jeffree with them impossible; the suggestion in Jeffree does not impart information to alter Evans and Poullain because no reason for making such a change is suggested, and because the attaining of a surface of revolution by imparting constant astigmatism to the face of the lens is not suggested by any of them. Furthermore, Evans and Poullain have one spherical face whereas in Jeffree both faces are aspherical.

There are too many differences between these patents to permit of combination by a skilled person to produce a result that none of them proposed, the first and only description of which has been supplied by the inventor, Guy Bach.

The Failure of the Court to Find the Facts and to Make Conclusions of Law

If the opinion of the court below is an adequate finding of the facts necessary to the ultimate decision then Rule 52 is a nullity. Especially as to basic claim 1.

Rule 52 reads as follows:

> "Rule 52. Findings by the Court.
>
> "(a) Effect. In all actions tried upon the facts without a jury or with an advisory jury, the court shall find the facts specially and state separately its conclusions of law thereon and direct the entry of the appropriate judgment; . . . If an opinion or memorandum of decision is filed, it will be sufficient if findings of fact and conclusions of law appear therein. . . ."

We understand the rule to require three things:

1. That the court shall find the facts specially;

2. The court shall state separately its conclusions of law thereon; and

3. The court shall direct the entry of the appropriate judgment.

It is also our understanding that the filing of an opinion or memorandum of decision is not a substitute for these requirements but that the findings must appear therein. *Life Savers Corp.* v. *Curtiss Candy Co.*, 182 F. 2d 4 (C.C.A. 7th). In other words, the court does not escape from the requirements of the rule by writing a memorandum opinion but must include its findings in the opinion. When a case is as complex in its facts as the present case is, it is as essential to comprehension as it is to a review of the court's judgment that the facts shall have been found. Merely to state conclusions under these circumstances is not reasonable compliance with the intent or the letter of the rule. No facts were found except as to sufficiency of disclosure, which is not before this court. The facts were not found for the essential point, brought here by appellant, lack of anticipation by the three references, especially as to basic claim 1.

In the present case it was essential, not only to a review of the case by this court that findings of fact should have been made, it was essential to a correct decision in the District Court, *Hurwitz* v. *Hurwitz,* 136 F. 2d 796 (78 ADC 70). The findings of fact proposed by the plaintiff-appellant were carefully drawn to assist the District Court to get its facts straight, but the District Court ignored them.

The scope and review of findings in patent cases is the same as in other types of cases. *O'Brien* v. *O'Brien,* 202 F. 2d 254 (C.C.A. 7th). Also technical complexity in patent cases suggests that the facts ought to be found.

The decision is clearly in violation of authority when the trial judge gives no weight to the defendants' failure, with a witness obviously available, to rebut the plaintiff's case. *Heim* v. *Universal Pictures Co., Inc.,* 154 F. 2d 480 (C.C.A. 2d). In this case the Patent Examiner was available but was not produced.

The following cases are also relevant:

If the District Court has failed to find essential facts on which the controversy depends, as it has failed in the present instance, the appellate court may remand the case to have the essential findings supplied. *Hunter* v. *Scruggs Drug Store, Inc.,* 113 F. 2d 971 (C.C.A. 4th), but where the essential issues are clear, remand is not essential. *Polariod Corp.* v. *arkham,* 151 F. 2d 89 (79 ADC 383, 81 ADC 383). In this case the essential issue is anticipation under 35 U.S.C. 103.

If adequate findings are not made, the case may be remanded. *Schilling* v. *Schwitzer-Cummins Co.,* 142 F. 2d 82 (App. D. C. 1944).

The findings of fact and conclusions of law which the plaintiff-appellant requested the court to adopt are found at JA 77a and 89a. A cursory inspection of those facts will demonstrate to the Honorable Court of Appeals that a study of them would have promoted comprehension and minimized error. The failure of the District Court to make the following findings of fact was prejudicial to the correct determination of the cause:

In the Plaintiff's Proposed Findings of Facts and Conclusions of law: Paragraphs Nos. 3A, B, C, D, 5, 6, 7, 8, 9, 10, 11, 12 (JA 77a et seq.)

In the Plaintiff's Motion under Rule 52(b) for Findings of Fact and Conclusions of Law and For Findings and Conclusions Additional to Those Already Requested; and Under Other Rules For Reversal of the Judgment: Paragraphs Nos. First, Second, Third, Fourth, Fifth, Sixth, Seventh, and Eighth (JA 89a et seq.).

Conclusion

Panfocal lenses are a difficult concept. Attempts to make them have occurred only at long intervals. Attempts to describe and explain the methods by which they might have been made have resulted in incomprehensible gobbledegook as in the case of the reference Jeffree. Others overlooked the necessity of making such lenses with two surfaces of revolution or, finding the necessity unattainable, produced something inferior as in the cases of the references Poullain and Evans.

As the introduction of astigmatism into the surface of any lens would have been considered inconsistent with common sense, because the introduction of that astigmatism would have blurred the eyesight of the lens wearer, it was in the highest degree inventive of the applicant, Guy Bach, to conceive that by introducing astigmatism into the front face and canceling it out with equal and opposite astigmatism in the rear face (e.g., as in Cl. 12) he could provide panfocal lenses with two surfaces of revolution. It is part of his discovery that the astigmatism must be constant if this is to be achieved.

The final description of the lens which his researches produced is found in claim 1, a brief review of which will be helpful. The claim is its own best statement and what follows is merely a paraphrase for emphasis.

The lens is panfocal; the material of which it is made has an index of refraction $\underline{n}$, which is fixed; each face of the lens is a surface of revolution; the first face has a meridian of constantly varying curvature and constant astigmatism in at least one region of substantial area of its surface.

It is our position that no person could have thought of such a lens at the time the references were published. The rejection is mere pretense derived from knowledge imparted by the applicant, Guy Bach, to the personnel of the Patent Office, who thereupon pretended to find in the three references the elements which had been disclosed to them by Bach.

Claim 2 depends from claim 1 and gives the mathematical formula for the lens. Had the references or any of them disclosed the Bach lens they would of absolute necessity, have disclosed the Bach formula. They did not and whatever formulas they did disclose bear no relationship to this.

Claim 5 includes all the substance of claims 1 and 2 and in addition it corrects for the astigmatism of the lens of the eye other than for farsightedness or nearsightedness. This claim deals with the constitution of the rear face of the lens and the compensation which it includes for the astigmatism of the first face and for the astigmatism of the eye. Had the references been related to the Bach invention they would also have described this method of compensation, but they did not.

Claim 6 emphasizes the fact that the second lens face has a meridian with a constant radius of curvature whereas the first face has a meridian whose curvature varies continuously. Claim 6 depends from claim 5.

Claim 7 is based upon claim 2 and emphasizes a fact which distinguishes this invention from any other: The curved meridian is presumed to develop the front face of the lens by rotation about an axis. This does not mean about a point. An axis is a straight line. Nothing like it is found in the references, who propose to make that face of the lens by rotating an infinite number of radii of different length around different points (Poullain and Evans), or to hand-make a lens by trial and error methods and then mold it, as Jeffree proposes. Claim 7 deals with a particular construction in which the meridian of the first face is composed of a plurality of arcuate segments.

Claim 8 specifies the shape of each of the arcuate segments of the meridian of claim 7.

Claim 9 is another claim dealing with the arcuate segments.

Claim 10 depends from claim 9 and defines the shape of each arcuate segment.

At this point let us pause to state that, so far as the record shows, adequate consideration was not given by the court to any claim. The distinguishing features of all the claims were ignored as though they had no existence. We find no adequate, or indeed, no consideration of the merits of the fundamental invention stated in claim 1.

Claims 12 and 13 define the lens in terms of two faces having confronting and opposite astigmatism. Claim 13 adds to claim 12 the mathematical definition of the face.

These concepts are not found in any reference. It is particularly to be noted that the cross examination of the witnesses did not touch upon this element of novelty. Consequently, claims 12 and 13 can hardly be said to be under any rejection at all. They are rejected, but arbitrarily.

To summarize the reference Jeffree: It suggests the possibility of using surfaces of revolution but does not describe how to obtain them and proceeds by hand working methods to the molding of lenses.

We remind the honorable Court of Appeals of its decision in *In re Burt,* 58 ADC 7, 24 F. 2d 273:

> "It is quite easy now that he has solved the problem to reach the conclusion that it was simple of solution; but the patent law contemplates rewarding the one who really solves it, and not the one who, after its solution, thinks he could have solved it."

We have one thing to add to the *Burt* case, namely, that the tribunals of the Patent Office have not made the solution to the problems of the panfocal lens appear to be simple. Their efforts have made it appear to be difficult.

We also remind the court of *In re Arthur L. Lee,* 92 U.S.P.Q. 131—CCPA

> Valid Reference Must Show Equivalent Combination
>
> "References which require material and radical modification in order to conform to the applicant's claims are not valid references unless they show an equivalent and operative combination which obviously could be substituted to meet the claims by any skilled mechanic."
>
> Doubts Resolved in Favor of Applicant
>
> "Where the individual features of the combination can be met only by unusual modification of features found in the prior art, thereby causing doubt on the

> question of patentability, courts have been accustomed to resolve doubts in favor of the applicant."

There is also a leading case in *Dewey & Almy Chemical Co.* v. *Mimex Co., Inc.*, 124 F. 2d 986 (1942), in which it was stated:

> "No doctrine of the patent law is better established than that a prior patent or other publication to be an anticipation must bear within its four corners adequate directions for the practice of the patent invalidated. If the earlier disclosure offers no more than a starting point for further experiments, if its teaching will sometimes succeed and sometimes fail, if it does not inform the art without more how to practice the new invention, it has not correspondingly enriched the store of common knowledge, and it is not an anticipation."

That is a doctrine which this court has frequently affirmed:

In re Ek, 57 ADC 203, 19 F. 2d 677, 678;
Becket v. *Coe,* 69 ADC 51, 98 F. 2d 332, 335.

See also:

Seymour v. *Osborne,* 11 Wall 516, 555, 20 L. Ed. 33.

Under the facts and the law the court below should be reversed. It is self-evident that the decision below was based on insufficient study of the evidence and material before the court; that grave error exists. Error being demonstrated and self-evident, it appears to be unnecessary to remand the case. The preferred procedure would appear, in this case, to be that this court act to reverse decisions which have been filled with error and contrary to well settled principles of law.

Respectfully submitted,

John L. Seymour,
Attorney for Plaintiff-Appellant.

CHAMBERS OF CHIEF JUDGE BAZELON

DLB-F-D
3/15/67
②

REPLY BRIEF FOR APPELLANT

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,255

COMPAGNIE DE SAINT-GOBAIN,
Appellant,

v.

EDWARD J. BRENNER, Commissioner of Patents,
Appellee.

AN APPEAL FROM A JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

United States Court of Appeals
for the District of Columbia Circuit

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United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 20,255

Compagnie De Saint-Gobain,
Appellant,
v.
Edward J. Brenner, Commissioner of Patents,
Appellee.

REPLY BRIEF FOR APPELLANT

I

An Admission of Error by the Honorable District Court is on the Record

The nature of the Appellee's Brief makes it appear that the appellees representatives, the Examiners, the honorable Board of Appeals, and the Solicitor have never understood the invention despite the most elaborate instruction from counsel for the appellant, and the clear presentation of evidence by skilled witnesses. In view of the confusion into which the appellee has fallen, as revealed in his brief, a review of the invention will reestablish a more accurate approach.

This invention relates principles of lens construction which had not previously been discovered.

The lens has three minimum requirements (claim 1):

1. It is panfocal, meaning that the meridian of the outer face has a continuously changing curvature, and that the

power of the lens increases progressively from the top to the bottom;

2. The outer face has an area of substantial magnitude which has constant astigmatism;

3. The outer face, despite the constant astigmatism, is a surface of revolution.

These three requirements constitute a combination of things which are unique with the new lens, the description of which has not been patented or published.

No such lens is to be found in the three references because they do not have such a disclosure. They are early attempts which fell short of what is here attained. This combination of three requirements is found only in the present disclosure and they set the new lens apart as the most advanced invention in this field of panfocal lenses.

The disclosure proceeds beyond this achievement and recites (in claims 12 and 13) a combination of four requirements, the foregoing three plus the provision on the second or rear face of the lens of an area having astigmatism opposite and equal to that of the front face.

It is wholly contrary to fact to pretend that such lenses have been described heretofore.

In addition to the novelty expressed in the foregoing two combinations, one of three and one of four elements, the development proceeds to yet greater novelty by specifying the mathematical formula by which this novelty is to be attained (claims 2, 5, 13). Such a formula is not to be found in any reference, the lack of which stamps them as primitive and devoid of anticipatory value.

This does not exhaust the novelty of the case because another very special and very new type of lens is achieved having a meridian of several arcuate segments (claims 7, 8, 9), the ends of which are coincident and are normal to a single perpendicular. Such a proposal is not to be found in any reference.

Finally, a method of correcting these new lenses for the astigmatism of the eye is set forth (claims 5, 9) and brings to light that major cause of the errors and confusion attending the prior proceedings, the existence of more than one kind of astigmatism.

It is no doubt difficult for the unskilled to understand that a lens surface may have an astigmatism of its own, and that such astigmatism has no relationship whatsoever to the astigmatism of the eye, relating solely to lens design and construction and not to correction of defects of the vision of a particular eye. This was not understood by Examiner, Board, or Judge and is a major cause of their errors.

These errors were repeated over and over by the appellee. For instance its brief has the following statements of obvious and flagrant misunderstanding:

> "Since it is generally recognized that constant astigmatism over the whole of the lens is advantageous",

a statement without foundation in fact and contrary to definition. (Appellee's Brief page 8 last 5 lines);

> "Evans states 'if required this graduated focal grinding can have a different dioptric power horizontally than vertically at the same point to *correct* astigmatism, . . .'" (Appellee's Brief page 13 last paragraph);
>
> ". . . it would clearly be obvious to use constant astigmatism" (Appellee's Brief page 14 last paragraph);

when one states that it "would be" obvious he means that it has not been stated.

> "Any introduced astigmatism would be as constant over the surface as possible to *provide uniform correction*" (Appellee's Brief, re Poullain at page 15, last paragraph)

There are many other errors of the same sort all showing that the appellant's lens was beyond the comprehension of the Office, the Court, and the Solicitor. They are always talking about correcting astigmatism, meaning that of the human eye. They never understood Bach's concept of introducing astigmatism of its own, unrelated to any eye, into the outer face of the lens. They are still foggily wandering in the pathless forest of their own incomprehension.

It is the *reductio ad absurdum* to pretend that that is obvious, which they did not comprehend.

That incomprehension proceeds to the ultimate of page 11, where they learnedly discuss Evans' inner lens face, but do not comprehend Evans' statement that his first (outer) face has "a single radius of curvature indicated at R^8", (Evans p. 2 lines 9-12 and Figs. 5, 6—JA p. 32a). In short, Evans has a spherical outer surface in which there is no astigmatism and no panfocality.

In order that the complete failure of comprehension below shall be made manifest beyond peradventure of doubt, we call attention to Solicitor's, Court's, and Board's many pretenses that it is obvious and desirable to introduce astigmatism into the face of a lens. A moment's thought demolishes the pretense:

What is astigmatism? It is the absence of stigmatism.

What is stigmatism? It is the focussing of the visual rays on the retina, providing clear vision.

To introduce astigmatism would destroy focus, so no person of skill would have introduced astigmatism, whether constant or inconstant. It would have blurred the vision. In pretending it obvious to violate scientific definition the tribunals below and their solicitor are guilty of concocting science fiction.

It is in the highest degree inventive for Bach to have discovered that the solution to the particular problems besetting the panfocal lens is to introduce constant astigmatism into the outer face of a lens of constantly varying meridian to produce a panfocal lens having two surfaces of revolution. His invention defies prior logic and could not have been foreseen by any skilled man.

The appellant has presented witnesses, and a scientific analysis of the references and the invention.

The appellee has presented no witnesses, has relied on the misconstruction and misinterpretation of documents, on the inclusion of prejudicial matter in its brief, and on argument which is unsupported by evidence and contrary to the statements of the very references relied on. The decision of the honorable District Court is contrary to the evidence which was before it and admits basic error.

Other principles of law and fact are applicable:

The Court below, finding itself beyond its depth in optics, attempted to save itself by over-simplification, pretending to itself that the problem is one of correcting the astigmatism of the eye (JA p. 97a *et seq.*):

> "Counsel (to the court): *That* is simply a bifocal lens, which has been ground out of one piece of glass instead of being assembled from two pieces of glass.
>
> "This is a lens in which there is a continuous variation from very far . . . graduated down to close position at the bottom; a complete and perfect graduation of vision.
>
> "(8) The Court: How does your lens differ from that [the bifocal]? You get the same thing, don't you, in the end?"

The honorable Court had not even mastered the concept of a panfocal lens, much less the mathematics of its construction. It was, after the trial, still confusing bifocal lenses with panfocal lenses. Futher (JA p. 100a):

> "Counsel: Now, we come to the point of your decision. And that is you were considering this astigmatism" (of the face of the lens) "as being a correction of the errors of the lens in the human eye.
>
> "The Court: That is what I always thought it was."

There, in the honorable Judge's own words, is his admission that he had not understood the invention and had mistaken the astigmatism put into a lens to correct astigmatism in the eye, for the constant astigmatism imparted to the face of a panfocal lens to make possible its generation as a surface of revolution.

The error is not only palpable and obvious, it is admitted on the record.

II

The Law of this Case in the Light of the Appellee's Brief

The law of this case may be summarized in several established legal principles which are so basic that they do not need the citation of authority.

A. Where there is no direct anticipation, invention is not negatived by the fact that some or all of the elements are old.

In re Willard, 45 ADC 549.
In re Eastwood, 33 ADC 291.
In re Rosenberg, 53 ADC 375.
In re Buchanan, 46 ADC 517.

B. No doctrine of the patent law is better established than that a prior patent or other publication to be an anticipation must bear within its four corners adequate directions for the practice of the invention. If the earlier patent offers no more than a starting point for further experiments (as in this case)—if its teaching will sometimes succeed and sometimes fail—(in this case the teachings of the prior art would always fail if they were followed; only by inserting appellant's teachings into the prior art does the appellee fabricate a rejection)—if it does not inform the art without more how to practice the new invention—(in this case the entire rejection rests upon the assertion that several of appellant's novelties would be obvious, which constitutes an admission that it is not disclosed and that one has to go beyond the teaching of the references to approximate appellant's lens)—it has not correspondingly enriched the store of common knowledge, and is not an anticipation—

> *Dewey and Almy* v. *Mimex,* 124 F. 2d 986.
> *Seymour* v. *Osborne,* 11 Wall. 516, 555; 20 L. Ed. 33.
> *Tilghman* v. *Proctor,* 102 U. S. 707, 712; 26 L. Ed. 279.

We maintain that the reference Poullain was before Evans as prior in time, that Evans and Poullain were prior to and before Jeffree, that each of these had knowledge of all that the earlier taught, and that none of them had taught the latter anything. This outstanding fact demolishes the pretense of obviousness and of unpatentability under section 103. If Evans and Poullain had taught anything, Jeffree would have used their teaching, which he did not.

The case for appellee has been made out by selecting phrases out of context from the three references, sometimes in obvious defiance of what the patentee himself said.

We note that the approach of the tribunals below does not conform to the requirements of the Supreme Court in *Graham et al.* v. *John Deere Company of Kansas City* *et al.; Calmar, Inc.* v. *Cook Chemical Company; Colgate-Palmolive Company* v. *Cook Chemical Company,* 148 U.S.P.Q. 459, particularly failing that no standard of the level of ordinary skill in the pertinent art was established in any of the decisions below. The decision is consequently legally faulty. The appellant conformed to the *John Deere* decision by presenting skilled persons as witnesses. Their testimony was ignored without explanation or excuse. That is reversible error in itself.

In *Wilson* v. *Simpson,* 9 How. 108, 123; 50 U. S. 109; 13 L. Ed. 66, it was stated:

> "Form may be given to a piece of any material, wood, metal, or glass—so as to produce an original result, or to aid the efficiency of one already known, and that would be the subject for a patent."

We note that the present lens has a different form from any of those which are described and shown in the refersences. As difference in form is of maximum importance in the lens art, this difference, being accurately expressed in the claims, should have been patented.

We remind the court of the excellent language found in *In re Burt,* 58 ADC 7:

> "It is quite easy now that he has solved the problem to reach the conclusion that it was simple of solution, but the patent law contemplates rewarding the one who really solves it, and not the one who, after its solution, thinks he could have solved it."

We draw the attention of the court to *Kryptok Co.* v. *Stead Lens Co.,* 207 F. 85. That case also had a problem of lenses. It was a relatively simple problem of bifocal lenses. It also involved pretended discovery of anticipatory references. The court applied the law of right reason to lens manufacture in the following words:

> "A patent for a combination [lens] is not anticipated nor invalid for lack of invention because an

expert may be able to build up the patented device by selecting parts taken from the prior art."

Our case differs notably from that one in that it has not been possible to build up the device from parts taken from the prior art. The combination recited in claim 1 has not been found. The constant astigmatism in the face of the lens has not been disclosed in any of the prior art and the court has been asked to assume that it is obvious even though to introduce astigmatism would have been considered unscientific before Bach's discovery. See also *Loom Co.* v. *Higgins,* 105 U. S. 580, 26 L. Ed. 1177.

III

Miscellaneous Errors

There is a principle known to debate that any person can ask in five minutes more questions than a learned man can answer in a century.

That principle has been adopted in those tribunals which follow the easy rule that a point no matter how trivial is automatically sustained if not answered. That compels one to load his brief with a multitude of comments the purpose of which is to answer a multitude of objections, statements, and assumptions. We assume that no such rule applies in this court but we add the following out of abundant precaution:

Comments on the Brief of Appellee

General Comment:

Appellee's Brief treats the evidence as non-existent except for excerpts out of context which do not represent the sense or the general tenor of the testimony.

Pages 1-3: The discussion of the claims is inadequate. The foregoing discussion should be referred to.

Paragraphs 1 and 2 on page 3 are improper as referring to rejections which were overruled by the court below, no appeal against that decision having been taken. These paragraphs are prejudicial and improper.

Page 4: The quotations from Poullain are generalities which are basically incomprehensible, which admit various interpretations, and which contain nothing comparable to the mathematical formulae found in some of appellant's claims.

Page 5: The quotation fromPoullain refers to correction of the astigmatism of the eye and equates the correction to well known types of lenses which are not panfocal.

Prior to Bach there never was any difficulty in making ordinary lenses with surfaces of revolution. Evans proposes to make a simple surface of revolution for his outer face. He did not conceive of introducing constant astigmatism into the face of the lens. Consequently, his outer surface has a single radius R8, making it spherical. (Figs. 5 and 6.)

In the phrase beginning "It is obvious . . ." Evans does not say how to do it.

Page 6: The quotation from Evans is another example of the basic error. Evans did not say that he introduced astigmatism. He states that he introduces it in order to *correct* astigmatism (of the eye). Bach's concept of introducing constant astigmatism for purposes of lens design is not present in Evans. The Appellee's Brief at this point exhibits the same lack of comprehension which we have criticized hereinabove. It should be noted that astigmatism introduced into any lens for the correction of astigmatism existing in an eye would not be a constant astigmatism but simply an astigmatism opposite to that of the eye.

The discussion of Jeffree found in our brief is a full and proper discussion of that reference. The discussion on page 6 of Appellee's Brief is inadequate to the point of triviality. The first quotation (JA 28a, p. 2, column 1, lines 6-12) signifies nothing in the absence of the appellant's description; let us analyze it as follows:

"... each surface being aspherical ..." This means that both inner and outer surfaces have some form, any form, which is not spherical, but it does not tell what those two forms will be. A pencil is not defined by stating that it is not shaped like an orange.

> "... having, for each point on both of its surfaces, the horizontal curvature greater than the vertical curvatures."

This states that there are different curvatures, horizontally and vertically, but it does not state what those curvatures are, and does not define any relationship of one to another. The quoted paragraph is incapable of giving any substantial picture of what Jeffree had in mind, and when Jeffree (at p. 2, second column and p. 3, first column) attempted to tell what he meant, he fell into language incomprehensible to anyone. The appellee has not tried to explain it.

In the other two quotations from Jeffree, the astigmatism referred to is that which is introduced for the correction of astigmatism in the eye.

Page 7: The proceedings before the District Court were in error of fact which the District Court admitted on rehearing, as quoted hereinabove.

Pages 8 and 9: The statement "... Each patent also calls for the addition of astigmatism to the surface of varying curvature. ..." is incorrect in fact and does not distinguish between astigmatism of the lens for purposes of panfocal design, Bach's invention, and astigmatism introduced to correct a defect of the eye.

The statement that it would be obvious to make the astigmatism constant is rooted in the same error, as a constant astigmatism could not conform to the astigmatism of an eye but would make vision worse. One does not introduce constant astigmatism to correct eye astigmatism, one introduces an astigmatism equal and opposite to that which exists in the eye.

The discussion of the references *Evans, Jeffree,* and *Poullain* on page 9 is trivial, unsubstantial and erroneous. For an understanding of these references we refer to our briefs and the testimony of the witnesses.

Pages 10-18: The appellee's argument as stated in these pages is rebutted by the testimony of Dr. John Stull at JA pages 71a-76a, the general tenor of which is indicated by the following questions and answers, (JA 73a and JA 74a):

> "Q. All right, let's go to the reference Evans, if you please. Now will you please tell the Court whether or not the reference Evans meets claim 1? A. No, it does not.
>
> "Q. In what way does it fail? A. Precisely the same, two ways. The Bach claim 1 specifies both surface being surfaces of revolution. Evans does not do this. Bach claim 1 claims constant astigmatism for the first face. Evans does not.
>
> "Q. Will you testify that none of the claims of the Bach case are anticipated by Evans? (66) A. Yes.
>
> "Q. Now will you take the Jeffree patent, please?
>
> > "Mr. Seymour: It has been agreed, Your Honor, that we may use the British Jeffree reference as a translation of the French.
>
> "By Mr. Seymour:
>
> "Q. Now, will you look at the Jeffree reference, and have you read it? A. I have read it.
>
> "Q. Now would you be good enough to take the Jeffree reference and tell us whether or not it is a complete and comprehensible describtion of the invention? A. No. The crux of my answer is that Jeffree

> does not tell me—although he tells me some geometry to do in his specification—why he does it. And I simply, therefore, cannot understand what it is that he is doing. . . .
>
> "Q. Now let us take the Jeffree British patent at page 2 of the complete specification beginning at line 105 and (67) going to line 41 on page 3. Is that subject matter a clear and comprehensible description of a lens or how to make it? A. My answer would have to be, no, that it isn't.
>
> "This was, incidentally, the part of Jeffree that I was talking about when I said he tells me some geometry to do but he doesn't tell me why and I can't understand it."

The foregoing are excerpts from the pages indicated. We may digress temporarily from the heart of the matter to inquire into the corrections for astigmatism of the eye which have so bemused the opposition. We refer to Dr. Stull's statement (JA p. 75a):

> "Now he [Jeffree] suggests as an example that this correction be made by producing what is essentially a cylindrical lens of some elastic material. He suggests gelatine. Which then will be cemented to the model which he has made using the curves covered in his main specification. From this then he will electroplate metal onto the model, and by techniques which are known he will make the two halves of a mold which will then serve as the mold for the lens that he will subsequently get."

Such a process is beyond belief. It is utterly incredible that the court below or any of the preceding tribunals should have thought that Jeffree's process should have pertained to this invention. There are no surfaces of revolution, no introduced constant astigmatism and nothing but a gelatine blank built up by accretions of gelatine to approximate a reversal of the eye.

The case presented by the appellee has been built up on assumptions of obviousness, on errors of understanding and of fact, and on the random selection of isolated generalties in the references.

The appellee repeatedly uses the word "obvious" to explain away the novelty which has not been found in any reference.

Possibly the simplest approach to the invention at this stage of the proceeding is through claim 2 wherein a mathematical formula is given for the derivation of the Bach lens. It is not pretended that any lens produced by the references corresponds to that formula, demonstrating the fact that this lens is something totally new and, consequently, patentable.

When an inventor has produced a new lens expressed by a mathematical formula for which not even a pretense of anticipation exists, it is a strange situation which denies him a patent.

Respectfully submitted,

JOHN L. SEYMOUR,
Attorney for Plaintiff-Appellant.

CHAMBERS OF CHIEF JUDGE BAZELON

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②

BRIEF FOR APPELLEE

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Appeal No. 20,255

COMPAGNIE DE SAINT-GOBAIN, APPELLANT

v.

EDWARD J. BRENNER, COMMISSIONER OF PATENTS,
APPELLEE

Appeal from the Judgment of the United States
District Court for the District of Columbia

JOSEPH SCHIMMEL, *Solicitor,*
United States Patent Office,
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S. WM. COCHRAN,
Of Counsel.

United States Court of Appeals
for the District of Columbia Circuit

FILED DEC 14 1966

Nathan J Paulson
CLERK

STATEMENT OF QUESTIONS PRESENTED

Appellee disagrees with appellant's Statement of Questions Presented. In the opinion of appellee, the questions presented are:

> 1. Whether the District Court was clearly in error in holding that the subject matter of the claims in the Bach patent application, Serial No. 687,821, would have been obvious at the time the Bach invention was made to a person having ordinary skill in the art of making optical lenses;
> 2. Whether the District Court acted improperly in giving weight to the decisions of the Patent Office examiner and the Board of Appeals in the absence of testimony by the examiner;
> 3. Whether the findings of fact and conclusions of law embodied in the District Court's memorandum opinion conform to the requirements of Rule 52 of the Federal Rules of Civil Procedure; and
> 4. Whether the District Court erred in failing to agree with the Patent Office that the claims in suit are unpatentable under 35 U.S.C. § 112 as being based on an insufficient disclosure.

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United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Appeal No. 20,255

COMPAGNIE DE SAINT-GOBAIN, APPELLANT

v.

EDWARD J. BRENNER, COMMISSIONER OF PATENTS,
APPELLEE

Appeal from the Judgment of the United States District Court for the District of Columbia

BRIEF FOR APPELLEE

COUNTERSTATEMENT OF THE CASE

Appellant's "Statement of the Case" is thought to be incomplete as a recitation of the facts material to a consideration of the questions presented. The material facts are believed to be those set forth in the remainder of this section.

Appellant's Patent Application

Appellant is the recorded assignee of the entire interest in the patent application here involved (JA-

3a), that of Guy Bach, Serial No. 687,821, filed in the Patent Office on October 2, 1957, and entitled "Optical Apparatus." The subject matter of the Bach application and claims is a lens, particularly adapted for use in corrective eye glasses, having a power which varies in a continuous manner from the top to the bottom of the lens. In one embodiment, both faces of the lens are surfaces of revolution, one of the faces having a curvature in the vertical meridian which varies continuously and said to have a constant astigmatism in a region of substantial area, and the other of the faces having a region of constant astigmatism, aligned with the region of asserted constant astigmatism on the first face, which is equal and opposite to that of the first face. In another embodiment, astigmatism is added in the second face to correct an eye defect.

The claims remaining in the application are claims 1, 2, 5 to 10, 12 and 13 (JA-16a). Claims 1, 2, 7, 8, 12, and 13 are readable on a first embodiment in which no provision is made for astigmatic correction of the eye. Claims 1 and 2 define only the characteristics of one face of a lens, specifying that it has continuously varying curvature and constant astigmatism in a region of substantial area. Claims 7 and 8 add the limitation that the curvature is made up of arcuate segments constituting, as specified in claim 8, involutes of circles. Claims 12 and 13 add to claims 1 and 2 the provision in the second lens face of an area of constant astigmatism.

Claims 5, 6, 9, and 10 are directed to a second embodiment, each calling, in addition to the subject matter of claim 2, for a second lens face having astigmatism which not only cancels that introduced in the front face but also provides astigmatic correction for an eye defect.

Prosecution Before the Patent Office Examiner

Prosecution of appellant's application before the Patent Office examiner culminated in final rejection of all of claims 1, 2, 5 to 10, 12, and 13 on the several grounds described by the examiner in his Answer (JA-18a) to appellant's brief before the Board of Appeals. Those grounds were as follows:

1. The claims were rejected under 35 USC § 112 (Act of July 19, 1952, C. 950, 66 Stat. 798) as being based on an insufficient disclosure in that the disclosure did not establish that a lens made by the process disclosed by Bach would, in fact, have constant astigmatism over a substantial area of its surface.

2. The claims were further rejected as failing to conform to 35 USC § 112 on the ground that they are indefinite and do not distinctly claim the invention in that they define the lens by a property possessed by the surface rather than by the nature of the surface configuration.

3. The claims were also rejected under 35 U.S.C. § 103 (Act of July 19, 1952, C. 950, 66 Stat. 798) as being directed to subject matter which is obvious in view of prior art, that is, the United States patents to Poullain et al., No. 1,143,316 (JA-30a), and Evans, No. 2,109,474 (JA-32a), and the French patent to Jeffree, No. 1,112,429 (JA-26a), which corre-

sponds to the British patent to Jeffree, No. 775,007 (JA-28a).*

The patent to Poullain et al. discloses a corrective eyeglass lens of the pan focal type which is (JA-30a, page 1, column 1, lines 33 to 41) "essentially characterized by this fact that it presents on one of its faces, or on both, surfaces with radii of variable curvature uniformly progressive; these surfaces can be combined with surfaces of the same kind or with other surfaces of constant radii of curvature." As to the curvature of one lens face in a plane perpendicular to the plane of the continuously curving meridian, Poullain et al. state (JA-30a, page 1, column 2, lines 79 to 87) that it is "a circular curve of radius equal or unequal to the radius of curvature of the principal section at this point," thereby indicating that astigmatism may, if desired, be introduced into the continuously curving face.** Poullain et al. state as to the second face:

> "The second face of the lens will be a surface of the same kind as the first or a sphere, a plane,

---

* All references to the Jeffree patent herein are to the British patent disclosure. That disclosure has been accepted by both parties as an accurate translation of the French patent. The French patent was relied on by the examiner because it has an earlier date of issue than the British patent.

** On page 2 of its Pre-trial Brief before the Court below, appellant defined astigmatism in a lens surface as follows:

> "Among oculists the term astigmatism generally means a difference in the sharpness of focus of horizontal and vertical lines in the image, arising from a difference in the curvature of the lens along the horizontal axis as compared to the vertical."

> a cylinder, or a torus" (JA-30a, page 1, column 3, lines 90 to 93);

and that:

> "In cases where it is at the same time desired to correct astigmatism the second surface may be a cylinder or a torus. The cylinders of the tori may have as their principal section a circumference or a curve with variable radii of curvature which will give lenses analogous to spherocylindrical and toric lenses."

The Evans patent discloses a panfocal lens which "varies in dioptric power from top to bottom with the near vision at the bottom" (JA-32a, page 1, column 1, lines 5 to 8). This graduated grinding, Evans states (page 1, column 2, lines 7 to 9), "may be imposed on the convex or concave or both sides of this lens as best suits various cases * * *." That the surface of continuously varying curvature is a surface of revolution is established by Evans' teaching as to his method of manufacture that "In either case the opposite ends of this generating curved line will swing across the lens surface on different radii centered in two fixed points respectively, the position of the points and the length of the two radii being chosen so as to produce the desired surface," (page 1, column 2, lines 26 to 31) and that "it is obvious that a lens of limited characteristics could be generated about one axis of generation, the dioptric power of which lens would vary gradually from one edge to the opposite edge" (page 1, column 2, lines 47 to 51). As to the introduction of astigmatism, Evans states (page 2, column 2, lines 21 to 24):

> "If required, this graduated focal grinding can have a different dioptric power horizontally than vertically at the same point in order to correct astigmatism, etc."

Jeffree describes a multifocal (panfocal) lens having introduced astigmatism in his statement (JA-28a, page 2, column 1, lines 6 to 12):

> "In accordance with the invention, there is provided a multifocal lens having its positive power increasing gradually from top to bottom in the vertical meridianal plane, each surface being aspherical and having, for each point on both of its surfaces, the horizontal curvature greater than the vertical curvatures."

Further, Jeffree expressly discloses that both of the surfaces of his lens are surfaces of revolution. He states (page 2, column 1, lines 51 to 58):

> "The simplest lenses according to this invention are those wherein both surfaces are surfaces of revolution. In general, since corrections for visual astigmatism have to be incorporated, the surfaces are conveniently those that are derived from surfaces of revolution by the addition thereto, as specified below, of suitable amounts of astigmatic correction."

The fact that Jeffree provides astigmatism in one face to cancel that introduced into another is shown in the statement (page 3, column 2, lines 108 to 114):

> "A lens so designed may be used without further modification when no corrections for visual astigmatism are required to be incorporated; as previously explained, when such corrections are

> required they are added to one or other surface of such a lens."

The rejection of the claims by the examiner was appealed to the Patent Office Board of Appeals.

The Decision by the Board of Appeals

Upon consideration of the record, appellant's briefs, the Examiner's Answer (JA-18a), and the matters raised at the hearing, the Board of Appeals affirmed the action of the examiner. The Board held (JA-36a and 40a) that the application insufficiently described Bach's attainment of constant astigmatism, that the claims were, as stated by the examiner, limited by the reference to constant astigmatism to a property of the surface rather than structure (JA-37a), and, finally, that the claims recited subject matter which would be obvious in view of the cited prior art.

The Review Proceedings

Appellant sought review of the Board of Appeals decision by the District Court under 35 U.S.C. 145. That Court, upon consideration of the Patent Office record and the trial evidence, held for defendant and dismissed the complaint (JA-88a). In its Opinion (JA-81a), the District Court stated (JA-84a) that the differences between the subject matter of the Bach application claims and the cited prior art, particularly the Jeffree patent, are such that the claimed subject matter would have been obvious to one skilled in the lens making art, and that the claims are, thus, unpatentable under 35 U.S.C. § 103. The Court held, however, that it did not agree with the Patent Office rejections of the claims as being based on an insufficient disclosure and as not distinctly setting forth the invention (JA-87a). Appeal to this Court followed (JA-103a).

STATUTES AND RULES INVOLVED

Act of July 19, 1952, C.950, 66 Stat. 798, U.S.C., Title 35 § 103

Act of July 19, 1952, C.950, 66 Stat. 798, U.S.C., Title 35 § 112

Act of July 19, 1952, C.950, 66 Stat. 803, U.S.C., Title 35 § 145

Rule 2 of the Rules of Practice of the United States Patent Office in Patent Cases, C.F.R., Title 37 § 1.2

Rule 52 of the Federal Rules of Civil Procedure

SUMMARY OF ARGUMENT

The lower court properly affirmed the action of the Patent Office in rejecting appellant's claims as unpatentable over the patents to Evans, Poullain et al., and Jeffree. All three of those patents explicitly disclose panfocal lenses, that is, lenses having a surface of continuously varying curvature. Each patent also calls for the addition of astigmatism to the surface of varying curvature. Since it is generally recognized that constant astigmatism over the whole of the lens is advantageous, it would be obvious to make the astigmation in the cited patent lenses as constant as possible over a substantial area of the lens.

The Evans disclosure and the trial testimony establish that Evans' said surface is a surface of revolution, and none of the claims, therefore, call for anything unobvious not shown by Evans.

While the Poullain et al. patent does not call for the surfaces of the lens disclosed therein to have surfaces of revolution, the production of such surfaces and their advantages are well known. To provide the Poullain et al. lens with surfaces of revolution would, accordingly, be obvious.

The Jeffree patent expressly calls for a lens having surfaces of revolution and also provides for the cancellation of astigmatism in one face by astigmatism introduced in the opposite face. Objections to the Jeffree disclosure as involving trial and error are not well taken because such methods are, apparently, those generally used, as witness appellant's own application disclosure.

Appellant's suggestions that appellee should have called the examiner as a witness and that the lower court improperly considered the examiner's holdings are contrary to accepted law. Appellant's assertion that the lower court failed to make findings and conclusions conforming to Rule 52 of the Federal Rules of Civil Procedure lacks factual basis.

The District Court erred in failing to approve the Patent Office rejection of the Bach claims on the ground that they are based on an insufficient disclosure. The specification fails to set out the astigmatic deviations of the described lens in areas laterally of the meridian. The record does not include evidence that the method described in the application will, in fact, produce a panfocal lens having astigmatism which is constant over a substantial area.

ARGUMENT

The Bach Application Claims Were Properly Held Unpatentable Over the Prior Art

As already noted, the District Court agreed with the Patent Office rejection of the Bach claims as unpatentable over the disclosure of any one of the patents to Evans, Poullain et al., or Jeffree.* According to appellant's analysis (Brief, page 4), "Claim 1 is fundamental." The "novelty" of that claim, appellant says (Brief, page 6), is that it calls for a panfocal lens of a given index of refraction, each face of which is a surface of revolution, the first face having continuously varying curvature and constant astigmatism in one substantial area. The District Court decision makes it clear that the Patent Office properly found all of those limitations to be expressly disclosed in each of the Evans, Poullain et al., and Jeffree patents or obvious in view thereof.

Considering first the Evans patent, the patentee clearly calls for a lens having a surface of continuously varying curvature, that is, a panfocal lens, in his statement that his lens "varies in dioptric power from top to bottom with the near vision at the bottom" (JA-32a, page 1 of specification, column 1, lines 5 to 8). As to whether Evans makes his lens in a way that his surface of continuously varying curvature is a surface of revolution is a matter which is, apparently, in dispute. Appellant says (Brief, page 6) that a surface of revolution is "novel in a panfocal lens," and he refers (Brief, page 19) to testimony by Dr. Stull to the same effect.

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* Neither the Patent Office nor the Court below found any need to combine the teachings of the cited references. Appellant's statements (Brief, pages 19 and 25) that the references are not combinable relate to a matter not in issue.

The Evans disclosure, particularly in view of Dr. Scholes' testimony, leaves no room for doubt that he does indeed disclose that his curved surface is a surface of revolution, and that the Patent Office and the District Court were correct in so holding. Evans makes his surface by selecting an appropriate median curve (page 2, column 1, lines 27 to 30), and the surface is generated by moving that line. Evans describes the generating step as follows (page 2, column 1, lines 44 to 51):

> "In any event, the inner surface of the lens may be conceived as generated by swinging this curved line transversely of the lens so that its upper end swings on a radius substantially equal to R^1, and its lower end swings on a radius substantially equal to R^7, these radii being centered in fixed points indicated respectively at X and Y on Figure 5."

The method of Evans was described in a question to Dr. Scholes on cross examination as follows (Suppl. JA-9a):

> "Q Now if you have decided—let's assume for a moment that you have decided on an appropriate curve for the meridian of a lens which is of progressively increasing curvature. And you are going to generate a surface with that meridian.

> And you swing the curve line transversely of the lens so that its upper end swings on a radius substantially equal to a certain radius, and its lower end swings on a radius which is a different radius. And the radii are centered in fixed points. Would you have a surface of revolution?
>
> Did you follow that, Doctor? I know it was a long question."

The resulting colloquy and the witness' eventual answer are as follows (Suppl. JA-9a):

> "A I think I did. You are not swinging that curve around the point, you are swinging it around that axis. That axis does not need to be parallel to the principal axis of the lens.
>
> Q Right.
>
> A And, therefore, you can have those radii of different lengths reaching to that axis at different positions.
>
> Q Yes. Would you by carrying out this process have a surface of revolution?
>
> A Yes, I have described that. We were talking just a moment ago about the geometry of the situation, which is something almost imaginary compared with the actual grinding of that surface, which I described in my previous testimony.
>
> Q Now you understood the conditions that I set up, and you say that if you do swing this curve around the axis, which is not parallel to the principal axis of the lens, you do have a surface of revolution?
>
> A Geometrically, yes."

Dr. Scholes testified, therefore, that the Evans process would produce a surface of revolution. Evans, at any rate, makes it clear beyond doubt that rotation of the curved line about a single axis (that is, to produce a surface of revolution) is at least one species of his method. He states (page 1, column 2, lines 40 and 41) that "It is not required that such a lens have an axis of generation; * * *" and that "However, it is obvious that a lens of limited characteristics could be generated about one axis of generation, the dioptric power of which lens would vary gradually from one edge to the opposite edge" (page 1, column 2, lines 47 to 51). The Evans disclosure, therefore, expressly refutes any contention by appellant that the patent does not disclose a surface of revolution in the continuously curving surface. Appellant makes no contention that Evans' other face is not a surface of revolution (and it clearly is, as disclosed at page 2, column 1, lines 9 to 12). The patent provides two such faces, therefore, as required by the claims.

As to the introduction of astigmatism in the continuously curving surface, Evans states (page 2, column 2, lines 21 to 24), "If required, this graduated focal grinding can have a different dioptric power horizontally than vertically at the same point to correct astigmatism, etc." The astigmatism so introduced would, of course, be constant, insofar as is possible, to afford the same correction no matter which portion of the lens is in use. This is a condition which, as Dr. Scholes stated (JA-9a), would be recognized by the art as desirable.

Appellant refers (Brief, page 18) to claim 1 of Evans as stating that "the curvature, at practically any point along one of said concentric lines being substantially equal to the vertical curvature at said point." Appellant concludes (Brief, page 18) "Hence, no astigmatism" and "The Evans lens has no astigmatism on any face." Those conclusions ignore the portions of Evans specification already referred to. Further, considering Evans' claims, appellant should have referred also, in the interest of completeness, to claim 11. That claim states (page 3 of patent specification, column 2, lines 25 to 28) in pertinent part:

> "* * * the dioptric curvature when measured horizontally at any point on one of the surfaces of said portion being different from the vertical curvature at said point, * * *."

Evans, in summary, combines in one lens a panfocal face, two surfaces of revolution, and constant astigmatism, as far as possible, over a substantial area. Claims 1 and 2 of the Bach application are, therefore, unpatentable over Evans since it would clearly be obvious to use constant astigmatism. Claims 5, 6, 9, 10, 12, and 13 add the feature of likewise adding astigmatism to the surface opposing the surface of varying curvature to cancel the introduced astigmatism or to provide astigmatic correction. The addition of such correction to the front face in Evans (the non-continuously curving face) would, it is submitted, be an obvious way to produce a lens without astigmatism or to add further astigmatism to that in the rear face.

The Poullain et al. patent, as previously noted, discloses a lens characterized by a face "with radii of curvature uniformly progressive" (JA-30a, page 1, column 1, lines 33 to 39), that is, a multi-focal lens such as that disclosed by Bach. Here again there is a dispute as to whether the method of manufacture disclosed in the patent results in a surface of varying curvature which is a surface of revolution. Whether or not Poullain et al. disclose making their lens faces as surfaces of revolution, such methods of manufacture are well known, as are their advantages. It would seem clearly to be obvious, if Poullain et al. do not disclose a surface of revolution, to alter their method to produce one.

Poullain et al. unquestionably do disclose the use of astigmatism in their surface of varying curvature. The patent states (page 1, column 2, lines 79 to 87) that the curvature of the lens in a plane perpendicular to the median plane at a given point may be "of radius equal or unequal" to the radius of curvature of the median at that point. Any introduced astigmatism would, as already pointed out, be as constant over the surface as possible to provide uniform correction. Poullain et al., like Evans, state that the progressive curvature of their lens face may be the involute of a circle ("circular evolvent spirals," page 2, lines 64 to 67.) The patentees thus suggest the use of astigmatic correction in both faces of the lens. The claims, therefore, call for subject matter which is obvious in view of the Poullain et al. patent.

The Jeffree patent describes (JA-28a, page 2, lines 7 to 12) "a multifocal lens having its positive power increasing gradually from top to bottom in the vertical meridianal plane, each surface being aspherical and having, for each point on both of its surfaces, the horizontal curvature greater than the vertical curvatures." Going no further than that sentence, it is clear that Jeffree discloses a panfocal lens having astigmatic correction on both faces, because the curvature of each face is different in the horizontal and vertical planes at any point. Further, Jeffree expressly states that both of the surfaces of his lens are surfaces of revolution (page 2, lines 51 to 53)* and that there may be added "suitable amounts of astigmatic correction" (page 2, lines 53 to 58). Such correction would, for reasons already established, be in constant amount, as far as possible, for the whole face of the lens. Jeffree, accordingly, discloses a lens which incorporates all of the features called for in claims 1 and 2. The use of the involute of a circle as the meridian in a panfocal lens is well-known, as shown by the Evans and Poullain et al. patents, and it would manifestly be obvious to employ a curve of that shape in the Jeffree lens. The subject matter of claims 7 and 8 represents, therefore, only an obvious departure from the Jeffree disclosure. Further, Jeffree expressly provides for the incorporation, in all modifications, of astigmatism in his continuously varying surface or surfaces (page 2, lines 6 to 12, and 113 to 120), and for astigmatic correction for eye defects when needed (page 3, lines 108 to 114). He necessarily contemplates, therefore, cancellation in an opposing surface of the introduced astigmatism, where no correction is needed, and the addition of astigmatism of the required amount and axis, where correction is required. The remaining claims, accordingly, call for nothing unobvious not suggested by Jeffree.

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* Appellant asserts (Brief, page 21) that a "minute analysis of the reasons why Jeffree does not have surfaces of revolution" was made by Dr. Stull, a witness, and is described on pages 70 to 74 of the record. Those pages of the Joint Appendix are believed to contain no such analysis, nor does there seem to be one elsewhere in the record.

Appellant's principal objection to the rejection on Jeffree appears, in summary, to be that the patent "makes proposals of what might be done, by trial and error methods, to make lenses by molding them, but does not state how it is to be done" (Brief, page 21). Any objection that Jeffree is limited to molding is not based on fact. Molding is only one of the manufacturing methods disclosed by Jeffree. He states (page 4, lines 1 to 5), "Lenses according to this invention are conveniently made by moulding in transparent plastic materials, but may also be made by grinding and machining processes of known type, in glass, plastics or other materials." Further, on that point, appellant's claims are not limited to any process of manufacture and could as well apply to molded lenses as those made by some other process.

The objection as to the use by Jeffree of "*trial and error*" is likewise not well taken. The passages apparently referred to by appellant on pages 20 and 21 of his brief * refer among other things to the provisional choice of a median curvature. Bach does the same thing. He says, in connection with the method of Figure 5, that a meridian C is chosen "which is known by general experience to be satisfactory as a meridian for a first main face of a lens" (JA-8a, 9a), which is no more specific than Jeffree's direction. Also referred to by appellant (Brief, pages 20 and 21) is Jeffree's choice of the horizontal curvature of the lens at each point on the meridian, or, in other words, the selection of the amount of astigmatism to be introduced. Bach's disclosure is no more specific. The value of K in Formula 2 (JA-9a) depends on the position of point O_1' on normal N_1 (Figure 5, JA-14a) and, Bach states, that point is initially "chosen arbitrarily" (JA-9a) and that there must be "a judicious choice of the point O_1'" (JA-9a), suggesting that trial and error is in order to arrive at the proper value of horizontal curvature. Bach's method of Figure 6 requires similar selection of the meridian (JA-10a) and calls for "repeated trials" to determine if the curve selected is suitable. Further, the proper value of the introduced astigmatism is indicated to be a matter of judgment (JA-10a). In summary, if Jeffree suffers from a disclosure which involves trial and error, so likewise does the Bach disclosure, and in the same respects. Appellant may not properly be heard to criticize a reference which suffers only from the defects found in its own application.

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* Appellant's brief refers at this point to the Jeffree patent disclosure, but in several instances cites passages on page 90 of the Joint Appendix, which seems not at all pertinent.

Appellant's Criticisms of the Procedure Followed in the Court Below Are Manifestly Without Merit

Appellant's criticism (Brief, pages 9 and 12) of the administration of the District Court with respect to the assignment of patent cases is manifestly out of order and of no pertinence to the issues presented. Discussion is deemed unnecessary.

Appellant complains on pages 8 to 11 of its Brief that the expert opinion of the Patent Office examiner was accepted as the test of obviousness, that "As no qualification was attempted his unsworn opinions do not satisfy the statute or the rules of evidence and were not properly before the court" (Brief, page 9), and that "The patent judge excused the Patent Office from compliance with the rules of evidence pertaining to qualifications of witnesses, to expert testimony, and to cross examination" (Brief, page 11).

From those contentions, it is apparent that appellant has mistaken the nature and effect of decisions of Patent Office tribunals on patentability. Those decisions are not mere expressions of opinion by experts but, rather, are administrative adjudications by government officials based on the evidence before them. Those rulings carry the presumption of correctness, and one who seeks review under 35 U.S.C. § 145 must assume the burden of proving unreasonableness or clear error in a Patent Office ruling on obviousness, *C. H. Boehringer Sohn* v. *Watson*, 103 U.S. App. D.C. 158, 256 F.2d 713. The rulings of the Patent Office examiner and the Board of Appeals were properly not considered by the District Court as mere opinion evidence on the question of invention.

They are administrative adjudications which are to be accepted if they are "consistent with the evidence," *Schafer* v. *Watson*, 109 U.S. App. D.C. 360, 288 F.2d 144.

Appellant's suggestions (Brief, pages 8 to 11) that the defendant should have called the examiner as a witness are also out of order in view of *United States* v. *Morgan*, 313 U.S. 409. In that case, the Secretary of Agriculture was subjected to examination in the lower court about his reading and considering evidence adduced in a proceeding in the Department leading to a rate-making decision. After discussing the Secretary's testimony, the Supreme Court held:

> "But the short of the business is that the Secretary should never have been subjected to this examination. The proceeding before the Secretary 'has a quality resembling that of a judicial proceeding,' * * *. Such an examination of a judge would be destructive of judicial responsibility. We have explicitly held in this very litigation that 'it was not the function of the court to probe the mental processes of the Secretary.' * * * Just as a judge cannot be subjected to such a scrutiny, * * * so the integrity of the administrative process must be equally respected."

Logically, that reasoning would apply as well to any Federal official who makes adjudicatory decisions as to the Secretary of Agriculture. Further, testimony by an examiner would violate Rule 2 of the Rules of Practice of the United States Patent Office in Patent Cases, which provides that "The action of the Patent

Office will be based exclusively on the written record in the Office."

On pages 26 to 28 of its Brief, appellant criticizes the District Court for failing to make findings of fact and conclusions of law separately from the memorandum opinion. Appellant's specific complaint (Brief, page 27), that "facts were not found for the essential point, * * * lack of anticipation by the three references, especially as to basic claim 1," is obviously without justification. Claim 1 is set out in the opinion as illustrative of the invention. In the discussion of each of the cited references (JA-81a to 84a), the Court paraphrased each of the limitations of that claim and applied them to the reference disclosures. The Court made a specific finding (JA-84a) that the subject matter of claim 1, as well as the other claims, was obvious, and made the specific conclusion (JA-85a) that "the claimed subject matter of the application in suit is unpatentable under 35 U.S.C. § 103." That appellant's complaint actually relates to the Court's failure to make specific findings contended for by appellant is made clear on page 28 of its Brief. The fact that "findings do not discuss propositions sincerely contended for, that, alone, does not make them inadequate or suggest that such propositions were not understood by the Court," *Schilling et al.* v. *Schwitzer-Cummins Co.*, 79 U.S. App. D.C. 20, 142 F.2d 82.

The Lower Court Erred in Not Holding the Claims Properly Rejected Under 35 U.S.C. 112

As previously indicated, the District Court, while agreeing with the Patent Office that the claims of appellant's application are unpatentable, stated (JA-87a) that it did not agree with one of the reasons advanced by the Office, failure of the application specification to comply with 35 U.S.C. § 112. It is believed that the lower court was in error in so ruling and consideration of that aspect of the Patent Office rejection is requested. That it is proper for appellee to advance such an additional reason to support the dismissal of the complaint is believed to be beyond question, *U. S. and Interstate Commerce Commission* v. *American Railway Express Company et al.*, 265 U.S. 425, 435.

As a principal basis for deciding appellant's specification to be sufficient under 35 U.S.C. § 112, the court stated (JA-85a) that "One factor which should be taken into consideration in determining sufficiency is the state of the particular art" and it pointed out (JA-85a) that the three reference patents "are characterized by a general vagueness and incompleteness of disclosure."

In so holding, the court is believed to have misunderstood the nature of the objection by the Patent Office to the Bach disclosure. There was no holding by the examiner that Bach's disclosure was vague or incomplete in its description of the process of manufacture disclosed. Rather, he held (JA-21a), and properly so it is submitted, that the application disclosure does not establish, by a sufficiently specific disclosure of an embodiment of the Bach lens, that a panfocal surface, made as described, will have constant or even substantially constant astigmatism over a substantial area. The examiner did not quarrel with the clarity of the disclosure, as far as it went, in describing how to make the surface (JA-21a). Rather he referred (JA-20a) to the recognition by those in the art of the problems inherent in avoiding astigmatic error differences. As noted by the examiner, Jeffree says, in referring to panfocal lenses (JA-28a, page 1, column 2, lines 57 to 85), that severe errors may be expected laterally of the meridian if the horizontal curves are made to match the vertical curvature at points on the meridian. If, however, the horizontal curves are made less to an appropriate degree than the vertical curves at points on the meridian (that is, astigmatism is introduced), there are astigmatic errors along the meridian. In view of such art-recognized difficulties in avoiding astigmatic errors in panfocal lenses, a specification asserting them to be solved would, it is clear, be sufficient only if it establishes that the claimed result is actually achieved.

The examiner was manifestly on sound ground in holding that the specification did not adequately disclose a lens having constant astigmatism over a substantial area. Bach's only attempt to describe the characteristics of a specific embodiment is in the table on page 5 of the application specification (JA-7a), which refers to Figure 4 in the drawings. That table describes x and y coordinates of a panfocal surface (although the coordinates are inconsistent with the curve shown in Figure 4) having an asserted constant astigmatism of 3 diopters. The deviation from that astigmatism along the meridian (which the specification says [JA-6a] is not material) is shown in the last column in the table.

The crucial lack, however, which is believed to render the specification insufficient under the law, is the failure to provide further columns showing astigmatic error differences at points progressively further away from the meridian. The claims call for constant astigmatism in a "substantial area" of the panfocal surface. A description in the specification of substantially constant astigmatism along a line in the lens establishes nothing as to an area, much less a "substantial area." The specification is, therefore, insufficient in itself to disclose a specific embodiment of a lens having the claimed characteristic of constant astigmatism in a substantial area of the panfocal surface.

Neither in the Patent Office nor in this proceeding has appellant presented evidence showing that the disclosed method of manufacture will actually produce a lens having the desired characteristic of constant astigmatism over a substantial area. A lens model (Plaintiff's Exhibit 4) was shown to the court below but the record is devoid of a specific description as to how that lens was made (that is, whether by any method disclosed in the application, the method of Figure 5 or that of Figure 6). In an affidavit filed in the Patent Office when the case was on appeal, plaintiff's counsel made the broad allegation that the exhibit "is a lens made according to the specification of this case * * *". Lacking allegations as to how counsel came by that knowledge, and the recitation of details as to precisely what method was employed, that statement constitutes no more than an unsupported conclusion. Particularly, no chart was presented to the Office to show the axis of rotation or the coordinates of the panfocal surface. Most important, the Patent Office prosecution record includes no specific information as to the deviations in astigmatism for points on the surface of the exhibit, either on the meridian or laterally thereof.

The evidence presented in this proceeding is no more effective. While Dr. Scholes testified (JA-64a) that he "believed" he could make a lens from the description in the specification, there was no testimony that he had ever attempted to do so. Dr. Stull is believed to have made no statement as to his ability to make the Bach lens. He merely asserted (JA-70a) that he understood the application disclosure.* Both witnesses stated (JA-62a and 69a) that they had no experience in lens making. Neither referred to any knowledge of the art-recognized difficulties inherent in panfocal lenses with respect to astigmatic errors.

The testimony by Dr. Scholes concerning Plaintiff's Exhibit 4 is believed clearly to be incompetent. There was no testimony as to how that lens was made and, insofar as the record shows, it could as well have been made by one of the reference processes as by Bach's. For that exhibit to be at all pertinent here, proof was necessary that it had been made by the Bach process (either that of Figure 5 or that of Figure 6). No such evidence was presented.

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* In this respect, Dr. Stull was like the examiner, who had no difficulty in understanding the disclosure. The examiner was properly skeptical, however, that the disclosed methods would produce the described lens.

Even if such evidence had been forthcoming, Dr. Scholes' testimony fails, it is submitted, to show error by the Patent Office. His measurements of the lens were made with a mechanical spherometer (JA-65a) about which there was no testimony as to its accuracy or its ability to detect small deviations in astigmatism. In the only specific figures given by Dr. Scholes (JA-66a), he stated that on the meridian "the top of the lens indicated something like 5 diopters in vertical curvature and at the bottom 8." Use of those round figures suggests that rough readings only were being made because of limitations of the instrument. To be effective here it was necessary for plaintiff to have established that the spherometer used was capable of detecting errors as small as ¼ diopter, said by the specification to be the largest error to be tolerated (JA-6a).

Any vagueness in the disclosures of the reference patents, as referred to by the court (JA-85a), is not pertinent, it is submitted. Whatever may be the defects in the references, none of them included the claim that substantially constant astigmatism had been achieved, as does Bach's disclosure. Further, even if the references suffered from the same defect as Bach's specification, that is not believed to be properly a factor to be considered. It is Section 112 of

Title 35, U.S.C., which constitutes the standard which the Bach disclosure must meet, not what the U. S. and French patent offices may have done in other cases. Stated otherwise, even if the Patent Office had made an error in the past, that would be no argument for the Court to authorize the commission of another. *Minnesota Mining & Mfg. Co.* v. *Coe*, 73 App. D.C. 146, 118 F.2d 593, *Edgerton* v. *Kingsland*, 83 U.S. App. D.C. 1, 168 F.2d 121, *In re Prutton*, 40 CCPA 724, 200 F.2d 706.

CONCLUSION

It is believed that the record fully supports the decision of the District Court that the claims of the application in suit are unpatentable under 35 U.S.C. § 103, and that appellant's critical comments on the handling of the case below are entirely without merit. It is submitted, on the other hand, that the District Court could properly have approved the Patent Office rejection of the claims on the further ground that they are based on an insufficient disclosure. The decision of the lower court should be affirmed.

Respectfully submitted,

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